PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

OCT 20 1941

OCTOBER, 1941

Journal of Educational Research

Registered June 4, 1929

CONTENTS

		PAGE
Recent Research Studies on Transfer of Training with Implications for the Curriculum Guidance, and Personnel Work	*Dr. Pedro T. Orata*	81
The California Test of Personality	*Ernest W. Tiegs*	102
A Study of Certain Factors Affecting English Usage	*Leland P. Bradford*	109
Spelling Disability Correlates II — Factors That May Be Related to Spelling Disability	*George Spache*	119
Increasing the Returns from Questionnaires	*Clarence Carl Moore*	138
Editorial: The Time, Money, Energy Factor in Experimental Evaluation		142
Reviews		144
Research Abstracts and Bibliographies		149
Research News and Communications		154

THE JOURNAL OF EDUCATIONAL RESEARCH is indexed in the Education Index

Edited and published by A. S. Barr, Professor of Education, University of Wisconsin, Madison, Wisconsin

Entered as second-class matter at the post office at Madison, Wisconsin under the act of March 3, 1879

JOURNAL OF EDUCATIONAL RESEARCH

EDITORIAL BOARD

A. S. BARR, *Chairman, Professor of Education, University of Wisconsin, Madison, Wisconsin*

E. J. ASHBAUGH, *Dean, College of Education, Miami University, Oxford, Ohio.* Administration, Supervision, and Teacher Training.

HARRY J. BAKER, *Director, Psychological Clinic, Detroit Public Schools, Detroit, Michigan.* Child Welfare, Guidance, and Development.

LEO J. BRUECKNER, *Professor of Education, University of Minnesota, Minneapolis, Minnesota.* Elementary Education.

CARTER V. GOOD, *Professor of Education, University of Cincinnati, Cincinnati, Ohio.* Learning, Teaching and Supervision.

KAI JENSEN, *Associate Professor of Education, University of Wisconsin, Madison, Wisconsin.* Preschool Education.

A. K. LOOMIS, *Board of Education, Shaker Heights, Cleveland, Ohio.* Curriculum Construction.

DOUGLAS E. SCATES, *Associate Professor of Education, Duke University, Durham, N. C.* Field Research.

PERCIVAL M. SYMONDS, *Professor of Education, Teachers College, Columbia University, New York City.* Mental Hygiene and Pupil Adjustment.

CLIFFORD WOODY, *Director, Bureau of Educational Reference and Research and Professor of Education, University of Michigan, Ann Arbor, Michigan.* Measurements, Statistics, and Research.

To save time, manuscripts may be sent directly to members of the editorial board

ASSOCIATE EDITORS

FRED C. AYER, *Professor of Educational Administration, University of Texas, Austin, Texas.*

EMMETT A. BETTS, *Research Professor and Director of the Reading Clinic, Pennsylvania State College, State College, Pennsylvania.*

PHILIP A. BOYER, *Director of Educational Research School District of Philadelphia, Philadelphia, Pennsylvania.*

FOWLER D. BROOKS, *Head of Department of Psychology, DePauw University, Greencastle, Indiana.*

WILLIAM A. BROWNELL, *Professor of Educational Psychology, Duke University, Durham, North Carolina.*

B. R. BUCKINGHAM, *Directing Editor of Elementary School Textbooks, Ginn and Company, Boston, Massachusetts.*

W. W. CHARTERS, *Director, Bureau of Educational Research, and Professor of Education, Ohio State University, Columbus, Ohio.*

VIRGIL E. DICKSON, *Superintendent of Schools, Berkeley Public Schools, Berkeley, California.*

EDGAR A. DOLL, *Director, Department of Research, Training School, Vineland, New Jersey.*

WILLIAM S. GRAY, *Executive Secretary of the Committee on the Preparation of Teachers, University of Chicago, Chicago, Illinois.*

CHARLES E. GREENE, *Superintendent of Schools, Denver Public Schools, Denver, Colorado.*

V. A. C. HENMON, *Professor of Psychology, University of Wisconsin, Madison, Wisconsin.*

KARL J. HOLZINGER, *Professor of Education, University of Chicago, Chicago, Illinois.*

ERNEST HORN, *Director, University Elementary School and Professor of Education, State University of Iowa, Iowa City, Iowa.*

EARL HUDELSON, *Dean, College of Education and Professor of Education, West Virginia University, Morgantown, West Virginia.*

FREDERICK J. KELLY, *Chief, Division of Higher Education, Office of Education, Federal Security Agency, Washington, D. C.*

CHARLES W. KNUDSEN, *Professor of Education, George Peabody College for Teachers, Nashville, Tennessee.*

ELISE H. MARTENS, *Senior Specialist in the Education of Exceptional Children, Office of Education, Federal Security Agency, Washington, D. C.*

WILLIAM A. McCALL, *Professor of Education, Teachers College, Columbia University, New York City.*

W. J. OSBURN, *Professor of Education, University of Washington, Seattle, Washington.*

JESSE B. SEARS, *Professor of Education, Stanford University, California.*

MANDEL SHERMAN, *Associate Professor of Educational Psychology, University of Chicago, Chicago, Illinois.*

FRANCIS T. SPAULDING, *Professor of Education, and Dean of Graduate School of Education, Harvard University, Cambridge, Massachusetts.*

JOHN L. STENQUIST, *Director, Bureau of Educational Research, Department of Education, Baltimore, Maryland; and Lecturer, University of Maryland.*

W. W. THEISEN, *Assistant Superintendent of Schools, Milwaukee, Wisconsin.*

M. R. TRABUE, *Dean, School of Education, Pennsylvania State College, State College, Pennsylvania.*

CARLETON W. WASHBURNE, *Superintendent of Schools, Winnetka Public Schools, Winnetka, Illinois.*

ELIZABETH L. WOODS, *Supervisor, Educational Research and Guidance, Los Angeles City Schools, Los Angeles, California.*

J. WAYNE WRIGHTSTONE, *Assistant Director, Bureau of Reference, Research, and Statistics, Board of Education of the City of New York, Brooklyn, N. Y.*

G. A. YOAKAM, *Professor of Education and Director, Courses in Elementary Education, University of Pittsburgh, Pittsburgh, Pennsylvania.*

The JOURNAL OF EDUCATIONAL RESEARCH is edited and published at Madison, Wisconsin, monthly except June, July, and August by A. S. Barr. The subscription price is $3.50; $3.70 in Canada, and $4.00 in other foreign countries. Single copies 50¢.

Address all communications to A. S. Barr, Department of Education, University of Wisconsin, Madison, Wisconsin.

Democrat Printing Company, Madison, Wisconsin

Copyright 1941 by A. S. Barr, Madison, Wisconsin.

JOURNAL *of* EDUCATIONAL RESEARCH

Volume XXXV OCTOBER, 1941 Number 2

RECENT RESEARCH STUDIES ON TRANSFER OF TRAINING WITH IMPLICATIONS FOR THE CURRICULUM, GUIDANCE, AND PERSONNEL WORK[1]

DR. PEDRO T. ORATA
National Council of Education
Manila, Philippine Islands

Editor's note: Whether one believes in the principles of the new education or the old the transference of training remains an important consideration. The author summarizes the research in this important field.

I. TRANSFER OF TRAINING AND NATIONAL DEFENSE

THE present emergency touches the problem of transfer of training at its most vital point. With feverish enthusiasm for training for defense and the attention of the nation keyed up to training in specific skills, we are likely to forget that the war is not apt to last through the remainder of the lifetime of even a middle-aged man now living. It is well to consider the effect of learning the new skills incidental to defense upon the post-war adjustment of those who must learn them. Even in England there is activity on foot now to prepare for the years immediately following the war.

The problem is how to arrange the new learning situations so that the resulting learnings will facilitate rather than inhibit future adjustments—in other words, how to provide for transfer from defense situations to post-war peace-time situations.

II. EXPERIMENTAL EVIDENCE

The evidence that has accumulated in the last six years confirms overwhelmingly the findings that have been summarized by the present reviewer, first in 1927[2] and again in 1935 (110), namely: first, transfer is a fact, as revealed by nearly eighty percent of the studies; second, transfer is not

[1] Read, in part, at the annual meeting of the American Educational Research Association in Atlantic City, February 24, 1941.

[2] Pedro T. Orata, *The Theory of Identical Elements.* Columbus, Ohio, Ohio State University Press, 1928. 204 p.

an automatic process that can be taken for granted, but it is to be worked for, even as democracy as a way of life has to be nurtured from the cradle to the grave and defended if it is to survive in a war-torn world (158, 175); and third, the amount of transfer is conditioned by many factors, among which are: age (25); mental ability (27); (possibly) time interval between learning and transfer (28, 2, 3, 4); degree of stability attained by the learned pattern (57); "knowledge of directions, favorable attitude toward the learning situation, and efficient use of past experience" (63); accuracy of learning (9); "conscious acceptance by the learner of methods, procedures, principles, sentiments and ideals" (77); meaningfulness of the learning situation (34); the personality of the subject—greater transfer in extroverts than in introverts (13); method of study (108); suitable organization of subject matter presentation (179); and provision for continuous reconstruction of experience (49, 175).

The data to date are indicated in the following tables.

TABLE I

STATISTICAL RESULTS OF TRANSFER EXPERIMENTS FROM 1935 TO 1940

Amount of Transfer Claimed	Classroom Experiments	Laboratory Studies	Total	%
Considerable	4	2	6	14.0
Appreciable	7	8	15	34.9
Varies with conditions of learning	2	10	12	27.9
Slight	4	1	5	11.6
None	2	--	2	4.6
Evidence not clear	1	--	1	2.4
Interference	--	2	2	4.6
Total[1]	20	23	43	100.0

[1]Two of the studies had two distinct parts, leaving a net total of 41 studies altogether.

TABLE II

STATISTICAL RESULTS OF TRANSFER EXPERIMENTS FROM 1890 TO 1940

(Percentages expressed in round numbers)

Amount of Transfer Claimed	1890–1927		1927–1935		1935–1941		Total	
	No.	%	No.	%	No.	%	No.	%
Considerable	32	32	15	22	6	14	53	25
Appreciable	49	49	31	44	15	35	95	45
Varies with conditions of learning	--	--	4	7	12	28	16	8
Very little	8	8	7	10	5	12	20	9
No transfer	2	2	5	8	2	5	9	4
Others (Duplications excluded)	9	9	6	9	3	6	18	9
Total	100	100	68	100	43	100	211	100

TABLE III

TABLE II SUMMARIZED

Amount of Transfer Claimed	1890–1927		1927–1935		1935–1941		Total	
	No.	%	No.	%	No.	%	No.	%
Clear evidence of transfer	81	81	50	73	33	77	164	78
Very little, no transfer, ambiguous evidence, interference, etc.	19	19	18	27	10	23	47	22

III. THE THEORY OF IDENTICAL ELEMENTS

The evidence which tends to disprove Thorndike's theory of identical elements continues to accumulate, despite Woodworth's effort to rehabilitate the theory by changing the word "identical" to "component" (145). In an earlier summary the present writer attempted to show that Thorndike's own studies, including, in fact, the very one upon which the theory was based, do not tend to support it. Now it would seem, as Cook points out, that "the theory of identical elements offers little insight into the problem of cross education (58)—transfer having been found, for instance, from one set of muscles to an antagonistic muscle group (16, 142, 143). Of the several direct tests made of the theory not one proved positive. Thus Freeman (68) concludes an extended study of the psycho-physiology of transfer: "Transfer is not caused by identity of elements in any part of the reaction arc." Ellis (65), likewise, points out that mere physical identity does not mean phenomenal (meaningful) identity—a familiar figure in a new setting may not even be seen at all. Gordon (32) also maintains that close correlation between two abilities does not guarantee that training will transfer from one to the other. On the other hand, Huang and Chang (80) in a study of maze learning find that common elements in two mazes were not seen as such and that the experimental subjects, in fact, "saw the two mazes as different structural wholes."

IV. THE ROLE OF INSIGHT AND GENERALIZATION IN LEARNING AND TRANSFER OF TRAINING

As the theory of identical elements tends to become obsolete the role of insight and generalization becomes more thoroughly established. It is now admitted by one of the most enthusiastic supporters of Thorndike that

the Generalization Method produces greater ability in spelling than the Specific Learning Method (31). Dashiell (60), with experimental confirmation by Evans (67), also maintains that organized habits are "vastly more than a chain of reflex arcs joined by the cement of kinesthetic impulses. Any well-learned performance remains a variable and adaptable performance." Experiments in animal learning tend to show that what is transferred is not a simple succession of elementary associations, but rather an attitude of response, a way of seeking the same kind of solution for different problems (61). The place of insight in learning seems to be as well established (112). Durkin (62) finds "definitely" that insight is a fact in problem solving, as it is also a factor in learning logical relations (121).

V. TRANSFER AS RECONSTRUCTION (REORGANIZATION) OF EXPERIENCE

The theory of transfer as reconstruction of experience, which was on the level of hypothesis in 1927[4] and 1935 (175), has gained support from two outstanding studies during the period of this report:

Katona's *Organizing and Memorizing* (34), which bears directly on transfer, and *Brownell's Learning as Reorganization: An Experimental Study in Third-Grade Arithmetic* (49), which shows that learning is primarily a process of reconstruction and not a mechanical affair which consists mainly of repetition of the same material until it is learned.

The most outstanding work on transfer during the period of this survey was that of George Katona, from the staff of the New School for Social Research, who undertook an exhaustive study of the problem under a grant from the Carnegie Corporation of New York. This work is comparable in the care and control of situations to that exercised by Lashley in his epoch-making study entitled *Brain Mechanisms and Intelligence,*[5] which dampened the enthusiasm of many of those who were inclined toward the mechanistic interpretation of human learning. Dr. Katona experimented with large numbers of human subjects in school and in lifelike situations and attempted, with great success, to distinguish between meaningful and senseless learning. He measured the relative effects of *understanding* and *repetition* as methods of learning to solve problems upon retention and the

[4] Pedro T. Orata, Op. cit., p. 157–179.
[5] University of Chicago Press, 1929.

ability to apply what is learned to new problems or situations. The experiments were repeated many times to safeguard against errors, and the results proved to be consistent in showing that while senseless learning does not transfer, meaningful learning does. In this latter case "100 percent transfer is the rule, not the exception; it is almost the mid-point of the distribution," as the following table shows (34, p. 130). In fact, transfer effect amounting to more than 100%, which, according to commonly accepted interpretation of transfer experiments, is impossible, if not a contradiction in terms, is not at all unusual, as shown by the fact that 36 of the subjects in the understanding groups in the following table had better scores in the "new" tasks than in the "practised" tasks; and, further, the occurrence of "infinite transfer effects" has been shown to be at least theoretically possible (34, p. 278).

TABLE IV

TRANSFER EFFECT IN DELAYED TESTS

(Scores in solving "new" tasks in relation to scores in solving "practiced" tasks)

Group	Number of Subjects		
	Higher	Equal	Lower
Understanding Group			
Experiment B	6	9	8
Experiment C1	7	4	8
Experiment C3	8	8	8
Experiment E1	7	4	8
Experiment E2	8	8	6
Total	36	33	38
Memorizing Groups			
Experiment B	1	1	15
Experiment C1	0	7	18
Experiment C3	2	3	17
Experiment EIII	0	1	20
Total	3	12	70

Says Katona, in part:

It has often been said that the establishment of mechanical habits is the opposite of transfer. This statement may be called correct if we attribute to the term "transfer" the meaning for which we have used the word "application." But when the term is employed with its other, more customary meaning, we must emphasize that acquisition of mechanical habits (memorization) and transfer (carrying over) are intimately connected, be-

cause, as we have seen, they both imply the establishment of specific learning effects. With meaningful learning most highly developed, we find that there is a plasticity or flexibility of learning which permits reasonable applications on a wide scale. These applications are due, not to the transfer of specific data from an A to a B, but to the fact that meaningful learning results in the acquisition of integrated knowledge, which is usable under different circumstances.

Theorizing a bit Katona continues:

Transfer in the sense of wide applicability is a concept related to transposition. When learning consists of acquiring whole-qualities, reproduction often takes the form of transposition—the elements are changed, but the whole-qualities, the essence, the principle are preserved in recollection. This rule holds good of "transfer," too. When whole-qualities are better preserved than the elements, we may apply them under changed circumstances. (34, p. 135–136.)

Among the many new features or findings of the study apart from the fact that 100% or more transfer effect is an established certainty are: (1) the subjects may have forgotten what they had learned (substance) entirely and still may be able to solve problems involving the same principle or method of approach (34, p. 125); (2) the development of a formula for finding transfer coefficients (34, p. 274), which is: Transfer effect of practise $A = \frac{\text{Test X} - \text{Initial Test X.}}{\text{Test A} - \text{Initial Test A}}$ Such a formula enabled him to compare the transfer coefficients in percentages of two groups in one experiment, as follows:

	Transfer Coefficients in Percentages				
Direct practise group	-0.3	7	16	21	24
Learning by understanding group	63.0	89	90	92	107

In pointing out the significance of his study, which supports Katona's implied theory of transfer as reconstruction of experience, Brownell (49, p. 78–79) says, in part:

What one does when one learns is to attack the new problem with whatever reactions are available. These reactions are seldom if ever of the blind trial-and-error variety, but represent forms of behavior which have been connected previously with some aspect of the problem situation. Thus, at the very outset of learning we encounter organization of behavior, and

not random or purely chance responses. The degree of success which attends the application of the first behavior organization determines (how, we need not say here) whether it will be retained and practiced, or rejected in place of another group of reactions which, like the first, have been connected with aspects, but different aspects, of the situation. As soon as some reasonably adequate reaction pattern is found, it is accepted as solving the problem. Recurrence of the problem situation sets off this adopted reaction pattern, thus insuring practice in its use. The result of the practice is increased facility in the functioning of the reaction pattern; that is, increased ease, speed, and accuracy of response. . . .

The process of learning thus becomes one of the organization and reorganization of behavior or experience. The fundamental issue in learning and in the direction of learning is not practice but rather the creation of a series of reaction patterns, each of which in turn gives way to a new pattern at a higher level of organization. Danger lies, not in the absence of practice, but in possible complacency with performance at a low level. And this danger is a real one when intelligent adjustment is involved, as it *is* involved in the kind of life we should set as the goal of experience.

VI. INADEQUACIES OF TRANSFER STUDIES

Of the many critical summaries of discussion and experimental work, pointing out specific inadequacies of transfer experiments and suggesting much needed improvements in the techniques used (61, 77, 111, 132), the following are outstanding: Griffith's (76) outline of the "features of a relevant experiment" calculated to minimize the defects of existing studies; Brownell's two comprehensive summaries, the first in 1936 (48) and the second in 1939 (47), which led him to conclude, first, that the time-honored controversy between the exponents of rival factions, Judd's side on generalization, Thorndike's on identical elements, and more recently that of the Gestalt people on functional similarity, be abandoned in favor of a more constructive discussion and experimentation leading toward the organization of materials and methods of instruction that would "guarantee the largest possible amount of transfer;" and second, that psychologists would serve education best by giving a greater share of their attention to learning problems that are like those of the school and that educationists, on the other hand, may well consider the danger of too limited a view of implementation and embark on a basis that would show them the basic principles of learning procedures that would guarantee the most widespread, the most certain, and the most permanent transfer of learning; and

Sandiford's six-point analysis (119). In this last case the extent to which Katona's study succeeded in overcoming the defects noted is indicated below:

Defects of Transfer Studies Noted	*Extent Avoided*
1. Inadequate techniques—failure to produce comparable groups.	Groups are comparable.
2. Concerned with special habits and skills and neglected fields of appreciation, attitudes, moral conduct, thinking, principles, etc.	Problem solving; Thinking; Principles.
3. Concerned with either college graduates (advanced) or with elementary pupils.	Mostly undergraduates.
4. Experiments of short duration.	Study covered a period of over two years.
5. Experiments have not been repeated to verify results.	Repeated many times with different groups.
6. Number of subjects has usually been small.	Small and large groups were used.

VII. IMPLICATIONS FOR THE CURRICULUM, GUIDANCE, AND PERSONNEL WORK[6]

The implications of these facts for the curriculum, guidance, and personnel work should not be difficult to draw. President Hutchins has raised the question regarding the wisdom of putting an undue emphasis upon vocational training on the ground that the United States will be defended not by guns, planes, and warships, but by morale of the American people. He favors the development of the "higher mental processes" as the safest course to take in this emergency. (This sounds a bit like formal discipline all over again, and no doubt Hutchins will not dispute this statement.) On the other side, the majority side, the dice are loaded in favor of all aid to Britain short of war, meaning vast and fast production of implements of war and their use both for the defense of the Western Hemisphere and by the allied armies abroad. The issue of cultural versus vocational education is more evident now than than ever before, with the odds favoring, for the first time in educational history, specific training for skills needed for immediate use in defense.

[6] Relatively speaking research in guidance and personnel work, aside from the many follow-up studies that are usually undertaken by graduate students for thesis purposes, is very small. Of 2,808 references examined by the present writer for the 1939 annual bibliography on guidance and occupational information for the U. S. Office of Education (in press), only 45 may be classified as research. The number of references on curriculum implications of guidance is even more limited. So far as the present reviewer knows no study was made in 1937, 1938 (of these two years over 4,000 references were examined), or 1939 of the implications of transfer studies for guidance and personnel work.

On the side of guidance the situation is very much the same. The guidance people are keyed up to defense, too, and the present situation does not alter their general presupposition that guidance must be specific if it is to be effective. With this added worry on their part—what should be the nature of the guidance process now that will provide the most effective readjustment later? On this question people in the guidance field are not very articulate. Like those in other phases of education, they want specific guidance that will result in the quick assignment of applicants to jobs, but they also want guidance to be general enough to enable the job holders to change to radically different jobs later without much loss of efficiency or time.

On the side of personnel work there is a growing trend toward the humanizing of school records and reports. Not mere child counting, but real child accounting seems to be the order of the day. If democracy as a way of life is to be promoted and preserved, the first place to begin, after the home, is the classroom, in which the human elements of cooperativeness, assumption of personal responsibilities, sensitivity to personal and social problems, ability to perform the necessary civic functions, and the like take the place of school marks in the school register and on the report card. To work for these directly and to work for their acquisition in a meaningful and understanding manner, not in senseless repetition, is to provide for their retention as functional patterns of behavior and for their transfer to the daily affairs of living in the home, on the bus, in the church, at the theater, at the grocery store, or wherever and whenever people are together.

BIBLIOGRAPHY

I. LABORATORY STUDIES

1. Bunch, M. E. Transfer of training in the mastery of an antagonistic habit after varying intervals of time, *Psychological Bulletin,* XXXVI (July 1939), 519–520; *Journal Comparative Psychology,* XXVIII (1939), 189–200; *Psychological Abstracts,* XIV (February 1940), 780.
2. ———, *and* McCraven, V. G. The temporal course of transfer in the learning of memory material, *Journal Comparative Psychology,* XXV (1938), 481–496; *Psychological Abstracts,* XII (October 1938), 5206.
3. ———, *and* Lang, E. S. The amount of transfer of training from partial learning after varying intervals of time, *Journal of Comparative Psychology,* XXVII (1939), 449–459; *Psychological Abstracts,* XIII (October 1939), 5064.

4. ———, *and* Rogers, M. The relationship between transfer and the length of the interval separating the mastery of two problems, *Journal of Comparative Psychology,* XXI (1936), 37–52; *Psychological Abstracts,* X (June 1936), 2961.

5. Cook, T. W. Guidance and transfer in part and whole learning of the disc transfer problem, *Journal of Educational Psychology,* XXX (1939), 303–308; *Psychological Abstracts,* XIII (November 1939), 5597.

6. ——— Amount of material and difficulty of problem solving problem. II: The disc transfer problem, *Journal of Experimental Psychology,* XX (March 1937), 288–296.

7. Crafts, L. W. Transfer as related to number of common elements, *Journal of General Psychology,* XIII (1935), 147–158; *Psychological Abstracts,* X (January 1936), 213.

8. Flory, Charles D. The effect of art training on mirror drawing, *Journal of Experimental Psychology,* XIX (February 1936), 99–105.

9. Gulliksen, H. The relationship between degree of original learning and degree of transfer, *Psychometrika,* I (1936), 37–43; *Psychological Abstracts,* X (August 1936), 4006.

10. Hall, B. E. Transfer of training in mirror tracing, *Journal of Experimental Psychology,* XXV (1939), 316–318; *Psychological Abstracts,* XIV (January 1940), 202.

11. Hulin, W. S., *and* Katz, D. Transfer of training in reading Braille, *American Journal of Psychology,* XLVI (1934), 627–631; *Psychological Abstracts,* IX (January 1936), 159.

12. Keeler, L. W. The effect of controlled attention upon transfer of training, *Psychological Bulletin,* XXXII (1935), 687; *Psychological Abstracts,* X (February 1936), 796.

13. Langer, W. C. An investigation of the positive transfer effects in the learning of a sensori-motor task, *Journal of Psychology,* III (April 1937), 371–379; *Psychological Abstracts,* XI (November 1937), 5012.

14. McKinney, F., *and* McGeoch, J. A. The character and extent of transfer in retroactive inhibition: disparate serial lists, *American Journal of Psychology,* XLVII (July 1935), 409–423, *Psychological Abstracts,* X (January 1936), 149.

15. Merlevede, D. Contribution a l'etude du transfert de l'effet de l'exercice moteur. (Contribution to the study of the transfer of motor training.), *Acta Psychol., Hague,* IV (1939), 305–322; *Psychological Abstracts,* XIII (October 1939), 5084.

16. Millisen, R., *and* Van Riper, C. Differential transfer of training in a rotary activity, *Journal of Experimental Psychology,* XXIV (June 1939), 640–646; *Psychological Abstracts,* XIII (October 1939), 5086.

17. Moore, Joseph E. Effect of art training on mirror drawing, *Journal of Experimental Psychology,* XXI (November 1937), 570–578.

18. Ruch, F. L. Kinesthesis, motivation, and transfer. I. Preliminary experiment and statement of problem, *Journal of Comparative Psychology,* XVIII (1934), 259–269, *Psychological Abstracts,* IX (February 1935), 647.
19. Sato, K. Studies on the apprehension of relation. Part II. 1. Experimental analysis of the problem of transfer of selective response, *Japanese Journal of Experimental Psychology,* III (1936), 219–261; *Psychological Abstracts,* XI (June 1937), 2667.
20. Telford, C. W., *and* Spangler, H. Training effects in motor skills, *Journal of Experimental Psychology,* XVIII (1935), 141–147; *Psychological Abstracts,* IX (July 1935), 3207.
21. Van Vorst, R. B. Transfer of training in the albino rat on horizontal and inclined elevated mazes of the same pattern, *Psychological Bulletin,* XXXV (1938), 529; *Psychological Abstracts,* XIII (January 1939), 193.
22. Watson, Brantley. The similarity factor in transfer and inhibition, *Journal of Educational Psychology,* XXIX (February 1938), 145–157.
23. Yamane, K. [An experimental study on the conditions of learning. IV. Transfer of learning in motor skill], *Japanese Journal of Psychology,* XIV (1939), 378–388; *Psychological Abstracts,* XIV (June 1940), 2923.

II. CLASSROOM INVESTIGATIONS

24. Babitz, M., *and* Keys, N. Experiment in teaching pupils to apply scientific principles, *Science Education,* XXIII (December 1939), 367–370.
25. Barlow, M. C. Transfer of training in reasoning, *Journal of Educational Psychology,* XXVIII (February 1937), 122–128.
26. Briones, I. T. An experimental comparison of two forms of linguistic learning, *Psychological Record,* XVI (1937), 205–214.
27. Brueckner, Leo J. New data on transfer in arithmetic. *In:* Reconstructing education through research. Official report of 1936 meeting. Washington, D. C., American educational research association, 1936. Pp. 212–218.
28. Bunch, M. E. The amount of transfer in rational learning as a function of time, *Journal of Comparative Psychology,* XXII (December 1936), 325–337; *Psychological Abstracts,* XI (March 1937), 1167.
29. Chapman, Florence L., *and* Gilbert, L. C. A study of the influence of familiarity of English words upon the learning of their foreign language equivalents, *Journal of Educational Psychology,* XXVIII (November 1937), 621–628.
30. Douglass, H. R., *and* Kittelson, C. The transfer of training in high school Latin to English grammar, spelling, and vocabulary, *Journal of Experimental Education,* IV (September 1935), 26–33; *Psychological Abstracts,* X (May 1936), 2661.
31. Gates, A. I. Generalization and transfer in spelling. Teachers college, Columbia university, 1935. Abstract *in: Teachers College Record,* XXXVII (October 1935), 60–61.
32. Gordon, M. A. General and specific factors in transfer of training within verbal tests, *Arch. Psychol., N. Y.,* No. 227, 1938, P. 41; *Psychological Abstracts,* XIII (January 1939), 175.

33. Grossnickle, Foster E. Transfer of knowledge of multiplication facts to their use in long division, *Journal of Educational Research,* XXIX (May 1936), 677–685; *Psychological Abstracts,* X (August 1936), 4234.
34. Katona, George. Organizing and memorizing. New York, Columbia university press, 1940. Abstract *in:* Transactions of the New York academy of sciences, Ser. II, Vol. 2, No. 2, December 1939. P. 59–61.
35. McGarvey, John W. Transfer of learning in elementary psychology (1) to popular misconceptions, and (2) to social science courses, *Psychological Bulletin,* XXXIV (November 1937), 704.
36. Mudge, Evelyn L. Transfer of training in chemistry. Doctor's, 1935. Johns Hopkins, Baltimore, Md., Johns Hopkins press, 1939. 76 p. (The Johns Hopkins university studies in education, No. 26.)
37. Pond, Frederick L. Influence of the study of Latin on word knowledge, *School Review,* XLVI (October 1938), 611–618.
38. Ryans, D. G. An experimental study of the transfer of training with special attention to the relation of intelligence test performance, *Journal of Educational Psychology,* XXVII (October 1936), 492–500; *Psychological Abstracts,* XI (March 1937), 1523.
39. Salisbury, R. Integration and transfer in the junior high school, *Clearing House,* IX (March 1935), 423–427.
40. Vaughan, W. F. Our impractical education, *School and Society,* XLVI (1937), 688–689; *Psychological Abstracts,* XII (March 1938), 1644.
41. White, Ernest E. A study of the possibility of improving habits of thought in school children by a training in logic, *British Journal of Educational Psychology,* VI (November 1936), 267–273.

III. RELATED STUDIES

42. Anastasi, A. The influence of specific experience upon mental organization, *Genet. Psychol. Monogr.,* XVIII (1936), 245–355; *Psychological Abstracts,* XI (May 1937), 2181.
43. Ballachey, E. L. The transfer of the pattern of centrifugal swing responses from one maze to another, *Psychological Bulletin,* XXXI (1934), 602; *Psychological Abstracts,* IX (February 1935), 617.
44. Britt, Steuart H. The learning-remembering process—(A reply to Professor Cason), *Psychological Review,* XLIV (November 1937), 462–469.
45. ——— Theories of retroactive inhibition, *Psychological Review,* XLIII (May 1936), 207–216.
46. ——— Retroactive inhibition: A review of the literature, *Psychological Bulletin,* XXXII (1935), 381–440.
47. Brownell, William A. Theoretical aspects of learning and transfer of training, *Review of Educational Research,* IX (June 1939), 255–273; 312–318.
48. ——— Theoretical aspects of learning and transfer of training, *Review of Educational Research,* VI (June 1936), 281–290; 337–339; *Psychological Abstracts,* XI (June 1937), 2642.

49. ——— Learning as reorganization: An experimental study in third grade arithmetic. Durham, N. C., Duke university press, 1939. 88 p. $1. (Duke university research studies in education No. 3.)

50. Brueckner, L. J. Curriculum investigations at the elementary- and secondary-school levels: Arithmetic, *Review of Educational Research,* IV (April 1934), 140–142, 215–217.

51. Bunch, M. E., *and* Winston, M. M. The relationship between the character of the transfer and retroactive inhibition, *American Journal of Psychology,* XLVIII (October 1936), 598–608; *Psychological Abstracts,* XI (February 1937) 649.

52. Buswell, Guy T. Types of learning and general conditions affecting learning, *Review of Educational Research,* IX (June 1939), 274–284; 318–321.

53. Buxton, C. E. Retroaction and gains in motor learning: III. Evaluation of results, *Journal of General Psychology,* XXII (1940), 309–320; *Psychological Abstracts,* XIV (September 1940), 4473.

54. Castiello, J. Geistesformung. (Mental formation.) Berlin: F. Dummler, 1934. Pp. 142. RM. 5.80, *Psychological Abstracts,* IX (June 1935), 2956.

55. Collier, R. M. The crossed effects upon voluntary movement of unilaterally induced fatigue, *Journal of Experimental Psychology,* XXIII (1938), 26–44; *Psychological Abstracts,* XII (November 1938), 5842.

56. Cook, T. W. Studies in cross education. III. Kinaesthetic learning of an irregular pattern, *Journal of Experimental Psychology,* XVII (1934), 749–762; *Psychological Abstracts,* IX (February 1935), 586.

57. Cook, T. W. Studies in cross education. IV. Permanence of transfer, *Journal of Experimental Psychology,* XVIII (1935), 255–266; *Psychological Abstracts,* IX (July 1935), 3175.

58. ——— Studies in cross education. V. Theoretical, *Psychological Review,* XLIII (March 1936), 149–178.

59. Croxton, Walter C. Pupil's ability to generalize, *School Science and Mathematics,* XXXVI (June 1936), 627–634.

60. Dashiell, John F. Contributions to education of scientific knowledge about the psychology of learning. *In:* The scientific movement in education, N. S. S. E. thirty-seventh yearbook, Part II. Bloomington, Ill., Public school publishing co., 1938. Chapter 32, p. 393–403.

61. De Montpellier, G. Le transfert des effets de l'exercice dans l'apprentissage animal. (The transfer of the effects of training in the learning animal.), *Rev. Belge Pedag.,* XVII (1935–1936), 11–13; 86–87; 151–154; 208–213; *Psychological Abstracts,* X (September 1936), 4427.

62. Durkin, Helen E. Trial and error, gradual analysis, and sudden reorganization: An experimental study of problem solving, *Archives of Psychology,* No. 210. New York, Columbia university, 1937. 85 p. Ph. D. thesis under R. S. Woodworth.

63. Eagleson, Oran W. A study of puzzle solving, *Journal of Psychology,* IX (April 1940), 259–268.

64. Eaton, Merrill Thomas. A study of bilateral transfer. Bloomington, Indiana university, 1938, *Bulletin of the School of Education,* XIV (March 1938), 25–39. (Two studies in education.) Bibliography of research studies in education 1937–1938, 352, 1940.

65. Ellis, Willis D. (University of Arizona.) Memory for physically identical elements in human maze learning: A transfer problem, *Psychological Bulletin,* XXXVI (July 1939), 545–546.

66. Ericksen, Stanford C. (University of Arkansas, Fayetteville, Ark.) A second study of the relative effect of a cerebral lesion on learning, transfer, and retention, *Psychological Bulletin,* XXXVI (October 1939), 634.

67. Evans, Sol. Flexibility of established habit, *Journal of General Psychology,* XIV (January 1936), 177–200.

68. Freeman, Graydon L. Studies in the psycho-physiology of transfer. I. The problem of identical elements, *Journal of Experimental Psychology,* XXI (November 1937), 521–532; *Psychological Abstracts,* XII (March 1938), 1204.

69. ——— Studies in the psycho-physiology of transfer: II. The relation of bilateral "fatigue" effects to period of work, *Journal of Psychology,* V (April 1938), 281–283; *Psychological Abstracts,* XII (September 1938), 4626.

70. ——— Studies in the psycho-physiology of transfer: III. Bilateral practice effects in normal and mirror writing, *Journal of Psychology,* V (April 1938), 285–289; *Psychological Abstracts,* XII (September 1938), 4627.

71. Gates, W. M. Correlation of arithmetic with everyday business, *National Business Education Quarterly,* IV (October 1935), 13–15.

72. Gibson, Eleanor J., *and* McGarvey, H. R. Experimental studies of thought and reasoning, *Psychological Bulletin,* XXXIV (June 1937), 327–350.

73. Gibson, James J., *and* Raffel, G. A technique of investigating retroactive and other inhibitory effects in immediate memory, *Journal of General Psychology,* XV (1936), 107–116.

74. ———, *and* Hudson, L. Bilateral transfer of the conditioned knee-jerk, *Journal of Experimental Psychology,* XVIII (1935), 774–783; *Psychological Abstracts,* X (April 1936), 1908.

75. Graham, James L. An experiment in generalizing: A unicursal problem, *Journal of Experimental Psychology,* XXIII (July 1938), 96–100.

76. Griffith, C. R. An introduction to educational psychology. N. Y., Farrar and Rinehart, 1935. Ch. XIII.

77. Hamley, H. R. Formal training: A critical survey of experimental work, *British Journal of Educational Psychology,* VI (November 1936), 233–249; *Psychological Abstracts,* XI (March 1937), 1176.

78. Higginson, G. D. Maze learning with knowledge of pattern similarity, *Journal of Experimental Psychology,* XX (March 1937), 223–243; *Psychological Abstracts,* XI (June 1937), 2653.

79. ——— Human learning with a related maze, *Journal of Psychology,* I (April 1936), 277–294.

80. Huang, L., *and* Chang C. [The identical elements and transfer of maze learning.], *Chung Hwa Educational Review,* XXIII (1935), No. 1, 55–65; *Psychological Abstracts,* X (October 1936), 4944.

81. Husband, R. W. Relearning vs. positive transfer, *Psychological Bulletin,* XXXVII (1940), 491–492; *Psychological Abstracts,* XIV (November 1940), 5413.

82. Jackson, T. A., *and others.* Studies in the transposition of learning by children, *Journal of Experimental Psychology,* XXIII (December 1938), 578–600.

83. Jacobsen, C. F., Taylor, F. V., *and* Haslerud, G. M. Restitution of function after cortical injury in monkeys, *American Journal of Physiology,* CXVI (1936), 85–86; *Psychological Abstracts,* X (October 1936), 4900.

84. Jenkins, J. G., *and* Sparks, W. M. Retroactive inhibition in foreign language study, *Psychological Bulletin,* XXXVII (1940), 470; *Psychological Abstracts,* XIV (November 1940), 5415.

85. Jones, Harold E., *and* Yoshioka, J. G. Differential errors in children's learning on a stylus maze, *Journal of Comparative Psychology,* XXV (June 1938), 463–480.

86. Jones, V. Negative transfer attending confusion of methods, *Psychological Bulletin,* XXXVII (1940), 490; *Psychological Abstracts,* XIV (November 1940), 5416.

87. Karn, H. W., *and* Patton, R. A. The transfer of double alternation behavior acquired in a temporal maze, *Journal of Comparative Psychology,* XXVIII (1939), 55–561; *Psychological Abstracts,* XIII (December 1939), 6127.

88. Katona, George. (New school for social research, New York.) Retention and transfer in different types of training, *Psychological Bulletin,* XXXVI (July 1939), 542–543.

89. ——— Organization in human learning, *Trans. N. Y. acad. sci.,* II (1939), 59–61; *Psychological Abstracts,* XIV (December 1940), 5885.

90. ——— Transfer of training and application of principles, *Psychological Bulletin,* XXXVI (October 1939), 660.

91. ——— On the relation between applicability of knowledge and methods of learning, *Psychological Bulletin,* XXXVII (1940), 490–491; *Psychological Abstracts,* XIV (November 1940), 5417.

92. Kellogg, W. N., *and* Walker, E. L. An analysis of the bilateral transfer of conditioning in dogs, in terms of the frequency, amplitude, and latency of the responses, *Journal of General Psychology,* XVIII (1938), 253–265; *Psychological Abstracts,* XII (September 1938), 4638.

93. ———, *and* ——— "Ambiguous conditioning," a phenomenon of bilateral transfer, *Journal of Comparative Psychology,* XXVI (1938), 63–78; *Psychological Abstracts,* XII (December 1938), 6287.

94. ——— Bilateral transfer of conditioning in dogs. Preliminary study, *Psychological Bulletin,* XXXIV (1937), 743; *Psychological Abstracts,* XII (March 1938), 1221.

95. Krechevsky. A study of the continuity of the problem-solving process, *Psychological Review,* XLV (March 1938), 107–133.
96. Langer, Walter C. The role of organization in the learning of sensori-motor task, *Journal of Psychology,* II (July 1936), 317–325.
97. ——— An experimental critique of the measures of learning, *Journal of Psychology,* III (January 1937), 195–221.
98. Lynch, J. A. The problem of transfer, *Journal of General Psychology,* XX (January 1939), 47–60; *Psychological Abstracts,* XIII (July 1939), 3574.
99. McGeoch, John A. Remote associations as a function of interpolated learning, *Psychological Bulletin,* XXXVI (July 1939), 545.
100. ——, *and* Grace O. Studies in retroactive inhibition: VI. The influence of the relative serial positions of interpolated synonyms, *Journal of Experimental Psychology,* XIX (February 1936), 1–23.
101. ——, *and* Grace O. Studies in retroactive inhibition: X. The influence of similarity of meaning between lists of paired associates, *Journal of Experimental Psychology,* XXI (September 1937), 320–329.
102. ——, McKinney, F., *and* Peters, H. N. Studies in retroactive inhibition: IX. Retroactive inhibition, reproductive inhibition, and reminiscence, *Journal of Experimental Psychology,* XX (February 1937), 131–143.
103. McKinney, F. Retroactive inhibition and recognition memory, *Journal of Experimental Psychology,* XVIII (October 1935), 585–598.
104. Maier, Norman R. F. Reasoning in rats and human beings, *Psychological Review,* XLIV (September 1937), 365–378.
105. Melton, Arthur W. The specificity of retroactive and proactive inhibition in serial verbal habits, *Psychological Bulletin,* XXXVI (July 1939), 544–545.
106. ——, *and* Irwin, J. M. The influence of degree of interpolated learning on retroactive inhibition and the overt transfer of specific responses, *American Journal of Psychology,* LIII (1940), 173–203; *Psychological Abstracts,* XIV (August 1940), 3998.
107. Newman, Edwin B. The temporal factor in retroactive inhibition, *Psychological Bulletin,* XXXVI (July 1939), 543–544.
108. Nihard, R. La valeur formative des humanites anciennes etudiee par les methodes experimentales. (The formative value of the study of Latin and Greek as shown by experimental methods.), *Humanisme,* No. 6 (1937), 23–31; *Psychological Abstracts,* XII (May 1938), 2643.
109. Oldfield, R. C. The learning of logically connected material, *British of Psychology,* XXVII (July 1936), 4–10.
110. Orata, Pedro T. Transfer of training and educational pseudo-science, *Educational Administration and Supervision,* XXI (April 1935), 241–264. Correction in same Journal, May 1935, p. 400.
111. Overman, J. R. Problem of transfer in arithmetic. *In:* National council of teachers of mathematics, tenth yearbook. Pp. 173–185.
112. Pickford, R. W. An experiment on insight, *British Journal of Psychology,* XXVIII (April 1938), 412–423.

113. Pillsbury, W. B. Retroactive inhibition tested immediately, *Psychological Bulletin,* XXXVI (July 1939), 544.

114. Porter, Elias H., Jr., *and* Hall, Calvin S. A further investigation of the role of emphasis in learning, *Journal of Experimental Psychology,* XXII (April 1938), 377–382.

115. Ray, Joseph J. The generalizing ability of dull, bright, and superior children. Nashville, Tenn., George Peabody college for teachers, 1936. 109 p. (Contributions to Education, No. 175.)

116. Razran, G. H. S. Studies in configurational conditioning: V. Generalization and transposition, *Journal of Genet. Psychology,* LVI (1940), 3–11; *Psychological Abstracts,* XIV (August 1940), 4006.

117. Reed, H. B. Meaning as a factor in learning, *Journal of Educational Psychology,* XXIX (September 1938), 419–430.

118. Roth, C. Experimentelle Untersuchungen zum Problem der "Gefuhlsubertragung." (Experimental investigations on the problem of emotional transfer.) Wurzburg: Myr, 1933. 119 pp. *Psychological Abstracts,* X (June 1936), 2863.

119. Sandiford, Peter. Transfer of training. School (Elem. and Sec. Ed.), XXVII (October 1938), 93–97.

120. Schmeidler, G. R. Retroaction and proaction in serial learning, *American Journal of Psychology,* LII (1939), 592–600; *Psychological Abstracts,* XIV (February 1940), 796.

121. Schooley, Mary, *and* Hartmann, George W. The role of insight in the learning of logical relations, *American Journal of Psychology,* XLIX (April 1937), 287–292.

122. Siipola, E. M. Implicit or partial reversion-errors: A technique of measurement and its relation to other measures of transfer, *Journal of Experimental Psychology,* XXVI (January 1940), 53–73.

123. ———, *and* Israel, H. E. Habit-interference as dependent upon stage of training, *American Journal of Psychology,* XLV (1933), 205–227; *Psychological Abstracts,* IX (May 1935) 2145.

124. ——— Studies in mirror-drawing. Smith college studies in psychology. Psychological monographs, Vol. 46, No. 6. Whole No. 210. Columbus, Ohio, *Psychological review co.,* 1935. Pp. 66–77.

125. Sisson, E. D. Retroactive inhibition: The influence of degree of associative value of original and interpolated lists. (*Journal of Experimental Psychology,* XXII (June 1938), 573–580.) *Education Abstracts,* III (October 1938).

126. ——— Retroactive inhibition: Serial versus random order of presentation of material. (*Journal of Experimental Psychology,* XXIII (September, 1938), 288–294.) *Education Abstracts,* III, (December 1938).

127. Smith, H. L., *and* Eaton, M. T. Two studies in education; the relations of accuracy to speed in addition and a study of bilateral transfer, *Bulletin Sch. Educ. Ind. Univ.,* 1938. Pp. 42. *Psychological Abstracts,* XIII (February 1939), 1106.

128. Spence, Kenneth W. The nature of discriminative learning in animals, *Psychological Review,* XLIII (September 1936), 427–449.

129. Stright, Isaac L. The relation of reading comprehension and efficient methods of study to skill in solving algebraic problems, *Mathematics Teacher,* XXXI (December 1938), 268–272.

130. Syngg, Donald. The relative difficulty of mechanically equivalent tasks: I. Human learning, *Pedagogical Seminary and Journal of Genetic Psychology,* XLVII (December 1935), 299–320.

131. Thorndike, E. L. A note on assimilation and interference, *American Journal of Psychology,* XLIX (October 1937), 671–676.

132. Varkonyi, H. Az alaki kepzes es atvitel kerdese. (Formal training and the problem of transfer.) Budapest, Paed. Bibl., Vol. 8, 1938. 99 pp. *Psychological Abstracts,* XIII (April 1939), 1907.

133. Vernon, Philip E. Intelligence test sophistication, *British Journal of Educational Psychology,* VIII (November 1938), 237–244.

134. Ward, L. B. Motor conflicts and transfer of training in high-grade mental defectives, *Proc. Amer. Assn. Ment. Def.,* XLI (1936), 50–59; *Psychological Abstracts,* XI (September 1937), 4187.

135. Waskom, Hugh L. An experimental analysis of incentive and forced application and their effect upon learning, *Journal of Psychology,* II (October 1936), 393–408.

136. Wees, W. R., *and* Line, W. The influence of form of a presentation upon reproduction: The principle of determination, *British Journal of Psychology,* XXVIII (October 1937), 167–189.

137. Welborn, E. L. Logical learning and retention: A general review of experiments with meaningful verbal materials, *Psychological Bulletin,* XXXIV (January 1937), 1–20.

138. Wells, F. L. Clinical aspects of functional transfer. (Psychometric practice in adults of superior intelligence, IV.) *American Journal of Orthopsychiatry,* IX (1939), 1–22; *Psychological Abstracts,* XIII (June 1939), 3317.

139. ——— Psychometric practice in adults of superior intelligence (III), *American Journal of Orthopsychiatry,* VIII (1938), 79–94; *Psychological Abstracts,* XII (August 1938), 3980.

140. Whitley, Paul L., *and* Blankenship, A. B. The influence of certain conditions prior to learning upon subsequent recall, *Journal of Experimental Psychology,* XIX (August 1936), 496–504.

141. Wickens, D. D. Transference of excitatory and inhibitory conditioning to an antagonistic muscle group, *Psychological Bulletin,* XXXIV (1937), 770–771; *Psychological Abstracts,* XII (March 1938), 1260.

142. ——— The simultaneous transfer of conditioned excitation and conditioned inhibition, *Journal of Experimental Psychology,* XXIV (1939), 332–338; *Psychological Abstracts,* XIII (July 1939), 3592.

143. ——— The transference of conditioned excitation and conditioned inhibition from one muscle group to the antagonistic muscle group, *Journal of Experimental Psychology,* XXII (February 1938), 101–123; *Psychological Abstracts,* XII (June 1938), 2884.

144. Wiley, L. E., *and* Wiley, A. M. Studies in the learning function, *Psychometrika,* II (March 1937), 1–19; 107–120; 161–164.

145. Woodworth, Robert S. Experimental psychology. N. Y., Henry Holt and co., 1938. Chapter VIII.

146. Woody, Clifford. Arithmetic—Special methods and psychology of the elementary-school subjects, *Review of Educational Research,* V (February 1935), 14–30, 93–97.

147. Young, Paul C. A natural case of transfer of training in handwriting from the left hand to the right hand, *Psychological Bulletin,* XXXIII (November 1936), 798.

148. Yu, T. H. Transfer of learning, *Chung Hwa Educational Review (Chinese),* XXII (1934), No. 5, 33–51; *Psychological Abstracts,* IX (April 1935), 1611.

149. Zangwill, O. L. The problem of retroactive inhibition in relation to recognition, *British Journal of Psychology,* XXVIII (January 1938), 229–247.

150. Allport, Gordon W. Personality: A psychological interpretation. N. Y., Henry Holt and co., 1937, Chapter X.

151. Bayles, E. E. An unemphasized factor in current theories regarding the transfer of training, *Journal of Educational Psychology,* XXVII (September 1936), 425–430; *Psychological Abstracts,* XI (January 1937), 142.

152. Bode, Boyd H. How we learn. Boston, D. C. Heath co., 1940. 308 pp.

153. Bond, E. A. Present status of the doctrine of transfer and application of the laws of learning to arithmetic. *In:* The professional treatment of the subject matter of arithmetic for teacher-training institutions, grades I to VI. New York, Teachers college, Columbia university, 1934. Pp. 15–25.

154. Breed, Frederick S. Generalization in spelling, *Elementary School Journal,* XXXVII (June 1937), 733–741.

155. Brown, C. A. Learning to use mathematics. *Clearing House* (Jr.–Sr. H. S. Ed.), X (September 1935), 26–28.

156. Brownell, William A. Two kinds of learning in arithmetic, *Journal of Educational Research,* XXXI (May 1938), 656–664.

157. Clausse, A. Le "transfer of training" et l'esprit d'observation. ("Transfer of training" and the power of observation.) *Arch. Educ., Brux.,* IV (1938), 263–274; *Psychological Abstracts,* XIV (September 1940), 4476.

158. Davis, Robert A. Adaptability of psychological techniques to the study of schoolroom learning, *Journal of Educational Research,* XXX (May 1937), 663–671.

159. Fawcett, H. P. Teaching for transfer, *Mathematics Teacher,* XXVIII (December 1935), 465–472.

160. Gemelli, Agostino. Exercise at apprentissage. (Exercise and learning.) *Travail Humain,* XXXI (1935), 1–28.

161. Gulliksen, Harold, *and* Wolfle, Dael L. A theory of learning and transfer: I. *Psychometrika,* III (September 1938), 127–149.

162. ———, *and* ——— A theory of learning and transfer: II. *Psychometrika,* III (December 1938), 225–251; *Psychological Abstracts,* XIII (April 1939), 1887.

163. Hall, Elizabeth L. Applying geometric methods of thinking to life situations, *Mathematics Teacher,* XXXI (December 1938), 379–384.

164. Hann–Kende, F. Zur ubertragung und gegenubertragung in der psychoanalyse. (Transference and counter-transference in psychoanalysis.) *Int. Z. Psychoanal.,* XXII (1936), 478–486; *Psychological Abstracts,* XI (May 1937), 2269.

165. Hedrik, Earle R. Teaching for transfer of training in mathematics, *Mathematics Teacher,* XXX (February 1937), 51–55.

166. Hissong, C. Transfer in teacher education, *Childhood Education,* XII (March 1936), 245–249.

167. Hsiao, H. H. Three major problems in the psychology of learning, *Educational Review (Chinese),* XXIV (1934), No. 1, 113–121; *Psychological Abstracts,* IX (April 1935), 1671.

168. Hull, Clark L. Mind, mechanism, and adaptive behavior, *Psychological Review,* XLIV (January 1937), 1–32.

169. Hutson, P. W. Need for reorientation of mathematics in the secondary school, *Mathematics Teacher,* XXVIII (March 1935), 145–153.

170. Judd, C. H., *and others.* Education as cultivation of the higher mental processes. New York, Macmillan co., 1936. 206 p.

171. Kellogg, W. N. Some objections to Professor Cason's definition of learning, *Psychological Review,* XLV (January 1938), 96–100.

172. Lazar, N. Importance of certain concepts and laws of logic for the study and teaching of geometry, *Mathematics Teacher,* XXXI (March 1938), 99–113. To be continued.

173. Men differ in abilities to transfer, *Science News Letter,* XXXV (February 11, 1939), 89.

174. Mulligan, H. A. Transfer of training: A problem for teachers of mathematics, *School (Secondary Edition),* XXVIII (June 1940), 872–875.

175. Nash, V. M. Latin in 1934–1935, *High School Teacher,* XI (February 1935), 43–44.

176. Orata, Pedro T. Transfer of training and reconstruction of experience, *Mathematics Teacher,* XXX (March 1937), 99–109.

177. Pax, Walter T. A critical study of Thorndike's theory and laws of learning. Educational Research Monograph, Vol. 11, No. 1. Washington, D. C., Catholic educational press, 1938. 175 p. *Educational Abstracts,* III (June 1938, October 1938).

178. Philips, Elinor Grace. The present status of transfer of training. Master's 1937. Michigan. Bibliography of research studies in education 1937–1938, 364, 1940.

179. Phillips, W. The general influence of studies. I. *British Journal of Educational Psychology,* VIII (February 1938), 50–62; *Psychological Abstracts,* XII (August 1938), 4369.
180. —— The general influence of studies. Part II. *British Journal of Educational Psychology,* VIII (June 1938), 115–128; *Psychological Abstracts,* XII (October 1938), 5570.
181. ——— Formal training; some comments upon Professor Hamley's article, *British Journal of Educational Psychology,* VII (February 1937), 89–93; *Psychological Abstracts,* XI (June 1937), 2955.
182. Rexroad, Carl N. Types and methods of learning, *Journal of General Psychology,* XV (July 1936), 196–205.
183. Rich, F. M. Famous fallacies: Mental discipline, *Journal of Education,* CXX (November 1937), 139.
184. Salisbury, R. Study habits and scatter-brain thoughts, *Wisconsin Journal of Education,* LXVII (September 1934), 5–7. Same *in: School and Community,* XXI (February 1935), 76–78; *Pennsylvania School Journal,* LXXXIII (April 1935), 425–426; *Nebraska Education Journal,* XV (April 1935), 156.
185. Selden, F. H. Transfer of training not a myth, *Journal of Education,* CXXI (April 1938), 120–121.
186. Schorling, R. Place of mathematics in general education, *School Science and Mathematics,* XL (January 1940), 14–26.
187. Skinner, Burrhus F. The behavior of organisms. New York, D. Appleton–Century co., 1938. 457 p.
188. Smith, R. R. Three major difficulties in the learning of demonstrative geometry, *Mathematics Teacher,* XXXIII (April 1940), 150–178.
189. Stephens, J. M. The influence of different stimuli upon preceding bonds. Teachers college, Columbia university, 1932. (Contributions to Education No. 493.)
190. Tolman, Edward C. Connectionism; wants, interests, and attitudes, *Character and Personality,* IV (March 1936), 245–253.
191. Toltchinsky, A. A. [The fundamental principles of training.] *Gigiena Truda,* No. V (1934), 30–32; *Psychological Abstracts,* X (June 1936) 3198.
192. Washburn, John N. The definition of learning, *Journal of Educational Psychology,* XXVII (November 1936), 603–611.
193. Wendt, George R. An interpretation of inhibition of conditioned reflexes as competition between reaction systems, *Psychological Review,* XLIII (May 1936), 258–281.
194. Werner, H. Process and achievement—A basic problem of education and developmental psychology, *Harvard Educational Review,* VII (May 1937), 353–368.
195. White, Ralph K. The completion hypothesis of reinforcement, *Psychological Review,* XLIII (September 1936), 396–404.
196. Whitmer, E. F. Youth speaks for mathematics, *School Science and Mathematics,* XL, 41–46.

THE CALIFORNIA TEST OF PERSONALITY[1]

ERNEST W. TIEGS
The University of Southern California
WILLIS W. CLARK
Los Angeles County Schools
LOUIS P. THORPE
The University of Southern California

Editor's note: Few subjects have received more attention than that of personality, especially during the last decade or so. The authors present data relative to a new instrument in this field.

PURPOSE OF THE SERIES

THE major purpose of each of the various series of the California Test of Personality is to implement the desire of teachers to deal more effectively with personality and social adjustment problems. These problems have long been associated with such objectives as good citizenship, clear thinking, initiative, originality, and personal and social efficiency and have been given new prominence in our thinking by recent movements in psychology and education.

The data with which these test series are concerned have frequently been designated as *intangibles,* because they have not been sufficiently analyzed, experimentally identified, classified, and described or otherwise reduced to carefully defined, identifiable elements. For example, such concepts as self-reliance, a sense of personal worth, or a feeling of belonging remain vague and unfocused unless they are carefully defined and then further objectified by specific concrete examples of evidences of their presence or absence.

The California Test of Personality represents an attempt to provide a group test to aid the teacher in dealing with the universal problem of personality adjustment and social effectiveness as she now uses tests to deal with problems of ability and academic achievement. However, both the identification of difficulties and the types of pupil guidance involved differ in many ways from the more academic techniques with which teachers are already familiar.

No one who has made a serious study of the nature of human adjustment has any illusions concerning the complex nature of the problems of

[1] Authors: Louis P. Thorpe, Willis W. Clark, and Ernest W. Tiegs. Published by the California Test Bureau, 3636 Beverly Boulevard, Los Angeles, California.

measurement and diagnosis involved; and new contributions frequently confuse rather than aid in the task. For example, the concept of the "wholeness" of the child is often erroneously interpreted as unfriendly to the sampling of specific elements of conduct. "Wholes" are understood and differentiated in terms of their constituent functional elements. The concept of "wholeness" merely emphasizes the necessity of viewing and interpreting specific aspects of conduct in their complex relations with other elements of the whole.

These test series are concerned primarily with the personality adjustment problems of all pupils, not merely with extreme or *problem* cases. However, since they provide profiles to detect extreme variations they include the detection of problem cases as well. Each series may also be given as an individual test for checking purposes.

DEVELOPMENT AND VALIDITY OF THE SERIES

The development of this series of tests proceeded from a study of over 1000 adjustment situations which children and youth must face in and out of school. These situations were classified into sixteen groups, personality areas, or components of personality. Many of these situations had previously been investigated by other workers and some of their values as indicators of adjustment, or lack of it, discovered.

After the list of 1000 situations had been carefully selected by the authors, it was subjected to further study by the following methods:

1. Teachers and principals were asked to indicate which items in their judgment were most valid as indicators of adjustment, and which items should be dropped, together with the reasons for their judgments.
2. Pupils in the grades for whom the test was intended were asked to respond to the items and to indicate which they felt they could or could not answer accurately and those which they would prefer not to answer.
3. Teachers completed the items for pupils whom they knew well, and these results were compared with the pupils' responses to the same items.
4. The relative significance of each item, so far as internal consistency is concerned, was determined by means of the bi-serial *r* technique.

After the judgments of pupils, teachers, and principals, as well as statistical findings on items were considered and many items had been

discarded there still remained many more than could be used in a single period test.

Statistical study of the items in relation to personality components revealed that many had been wrongly classified. Some of these were discarded and others were moved into their appropriate classifications. Some items previously judged invalid or otherwise undesirable proved to be good indicators. A study of the statistical data raised serious doubts about the existence of three of the original components and these were omitted. Two of the other components proved to be practically identical and their items were thrown together and treated as one component.

The authors found pupils loath to respond honestly to certain types of factual items which appeared important as indicators of adjustment; hence they attempted to obtain the maximum number of correct responses by *rationalizing as many as possible for the pupil.* They do not ask, "Do you play truant?" but rather, "Are things frequently so bad at school that you just naturally stay away?" They do not ask, "Do you quarrel or are you quarrelsome?" but, "Does someone quarrel with you too much of the time?" Such disguised items do not tempt the student to detect their purpose by asking, "Do you exaggerate your illnesses?" but instead ask, "Do you suffer more than most people when you are ill?"

The final selection of items in each of the twelve components (12 items in each in the Elementary Series; 15 times each in the Intermediate Series*) was partially arbitrary, since a one-period test was desired in each case. By this time there were on hand a considerable number of clinical data which could be considered in connection with many of the items.

RELIABILITY DATA

The *reliability* of the Secondary Series is typical and is presented. It is based on 558 cases using the split-halves method and corrected by the Spearman–Brown formula:

	r	S. D. dist. score	P. E. est. score
Total Adjustment	.931	19.9	3.5
Sec. 1 Self Adjustment	.904	11.5	2.4
Sec. 2 Social Adjustment	.908	10.0	2.0

* A Primary and an Adult form are being validated and will complete the series.

The correlation between Section 1 and Section 2, .54, is sufficiently low to emphasize the desirability of studying the student from the standpoint of both self-adjustment and social adjustment. The reliabilities of the component tests vary from .60 to .87 and are thus sufficiently high to identify the areas in which personality difficulties exist as a point of departure in investigating the specific difficulties themselves. As soon as the principal specific adjustment problems have been identified the teacher should consult Part IX of the Manual for methods of treatment.

THE COMPONENTS OF PERSONALITY

The components finally selected, defined, and objectified through specific items are as follows:

ORGANIZATION OF THE CALIFORNIA TEST OF PERSONALITY

LIFE ADJUSTMENT: A balance between self and social adjustment

1. Self Adjustment: Based on feelings of personal security
   - A. Self-reliance
   - B. Sense of Personal Worth
   - C. Sense of Personal Freedom
   - D. Feeling of Belonging
   - E. Freedom from Withdrawing Tendencies
   - F. Freedom from Nervous Symptoms
2. Social Adjustment: Based on feelings of social security
   - A. Social Standards
   - B. Social Skills
   - C. Freedom from Antisocial Tendencies
   - D. Family Relations
   - E. School Relations
   - F. Community Relations

Special attention should be called to the fact that these twelve components are not personality *traits* as this term has been used in the literature of the field. They represent, rather, characteristic modes of response to situations in certain fields or areas of personality which reveal whether or not the pupil's basic drives, urges, or desires are being met in an atmosphere of security and whether or not he is developing a balanced sense of self-realization and social acceptance.

INTERPRETATION OF SCORES AND PROFILES

Each series of the California Test of Personality is available in both the hand and machine scored editions. The latter makes it possible to score the tests of a large number of pupils in the minimum amount of time.

The responses of each pupil are interpreted with respect to percentile norms which are provided. These norms, together with a profile, reveal at a glance how each individual subject compares with a large unselected group in total or life adjustment, self-adjustment, social adjustment, and in each of twelve components of personality.

The profile of Helen Smith presented herewith represents a record of her responses in terms of possible scores, actual scores, and percentile ranks. This record reveals her major problem areas and constitutes the point of departure in locating her specific difficulties from the original test, as well

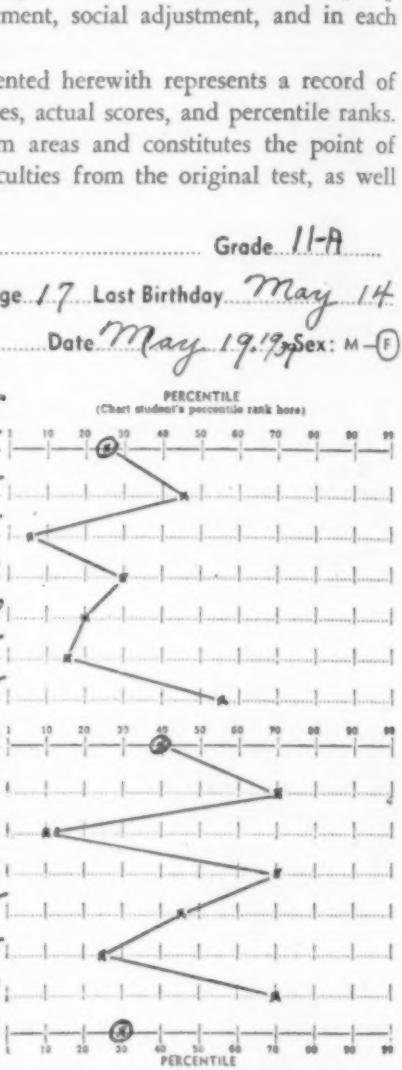
Name Helen Smith Grade 11-A

School Lincoln High Age 17 Last Birthday May 14

Teacher Miss Brown Date May 19, 19— Sex: M—(F)

COMPONENTS	Possible Score	Student's Score	Percentile Rank
1. Self Adjustment	90	60	25
A. Self-reliance	15	9	45
B. Sense of Personal Worth	15	5	5
C. Sense of Personal Freedom	15	12	30
D. Feeling of Belonging	15	11	20
E. Withdrawing Tendencies (Freedom from)	15	9	15
F. Nervous Symptoms (Freedom from)	15	11	55
2. Social Adjustment	90	71	40
A. Social Standards	15	14	70
B. Social Skills	15	9	10
C. Anti-social Tendencies (Freedom from)	15	13	70
D. Family Relations	15	12	45
E. School Relations	15	10	25
F. Community Relations	15	13	70
TOTAL ADJUSTMENT	180	131	30

PERCENTILE (Chart student's percentile rank here)



as the types of treatment suggested in the manual. Data from thousands of cases indicate that few pupils are free from adjustment problems which teachers may aid them in solving.

Some teachers report that they first make a composite profile for a whole class in order to locate class problems. A problem or adjustment difficulty is indicated for a class or for an individual when parts of the profile extend far to the left. A large section of the manual is devoted to aiding teachers in differentiating and analyzing cases needing special assistance and suggesting desirable guidance activities.

FACTOR ANALYSES

The factor analyses made in collection with the validation of this series will be of interest primarily to advanced students and research workers. For this reason, tables presenting each correlational matrix and the centroid and rotated factor loadings are omitted. However, a brief summary will indicate to these workers the general nature of the results obtained.*

1. *Factor Loadings.* In general, the factor loadings follow the same patterns as those obtained from achievement and intelligence test data. The factors extracted apparently represent realities which differ materially from the concepts currently used by teachers and laymen in attempting to describe personality and adjustment. For this reason, the results are of more use in guiding further studies and in interpreting personality data than in determining the basic organization of tests and questionnaires themselves.

2. *The factors.* Ten factors were extracted in each case, using Thurstone's[1] centroid method, and the sum of the variances of these ten sets of factor loadings was assumed to represent the approximate total variance. Since no significant variance was obtained after the sixth factor, only the latter data were used in obtaining the rotated factor loadings.

3. *Rotation procedures.* In reducing and eliminating negative values and making the data psychologically more interpretable, Guilford's graphic method[2] of rotation was used. In order not to disturb the original centroid order, no factor was rotated through an angle greater than 45 degrees.

---

* A limited number of mimeographed copies of these results are available for distribution until they appear in published form.

[1] L. L. Thurstone, *The Vectors of Mind* (Chicago: University of Chicago Press, 1935).

[2] P. I. Guilford, *Psychometric Methods* (New York: McGraw–Hill Book Company, 1936).

Rotation was continued in each case until all negative values were as small as possible and as many zero values (values in the reference axes) as possible had been obtained. Results indicate that substantially the same final loadings are obtained regardless of the particular order in which factors are rotated.

CONCLUSION

Neither the exact nature nor the minimum number of dimensions or factors necessary to describe the functioning personality adequately is yet known; and were these data at present obtainable, problems in utilizing them to improve personality and adjustment still remain to be solved.

However, there is a growing conviction that guiding children and youth in the development of well-balanced effective personalities is the teacher's most important function. Under the best present conditions only a limited few cases of maladjustment can hope to receive the attention of a child guidance clinic or a psychiatrist. Unless teachers can be aided in developing the ability to identify incipient and actual maladjustment and in giving assistance at the points of need the schools will continue to graduate warped personalities, many of whom will go on to swell the dreadful toll of crime and insanity to which maladjustment may lead. At the present time, those who are treated in state and private hospitals for nervous and mental diseases, confined in jails and prisons, and are wards of the juvenile court exceed in number those who enter college and university each year.

And so in spite of the limitations from which any present instrument must suffer, the authors offer their effort in the hope that it may prove helpful in the attack on this serious problem. The California Test of Personality is essentially an attempt to adapt clinical procedures to group testing and re-education. The authors believe that their component determination, objectified through validated specific situations and supplemented by the related materials on improvement activities, does furnish for teachers a practical and helpful basis for diagnosis and guidance.

A STUDY OF CERTAIN FACTORS AFFECTING ENGLISH USAGE

LELAND P. BRADFORD
University of Illinois

Editor's note: English usage is ordinarily assumed to be influenced by a large variety of factors. The author attempts to objectify and collect data with reference to certain of these factors.

WHILE the statement that a large number of factors influence the type and correctness of English usage of individuals would undoubtedly be accepted by educators, little has been done to determine carefully either the identity or the relative importance of these factors upon such usage. The working assumption is made that formal teaching of grammar is one of the most important influences upon English usage. Otherwise there would be slight justification for the amount of emphasis placed upon the learning of grammar on most educational levels.

The relative effect upon English usage of the teaching of formal grammar in schools should be examined. Recent studies, most notably O'Rourke's (2), have indicated that there is far from complete mastery of even the essentials of English usage by students undergoing formal training in grammar. O'Rourke found only 34.7% mastery of essentials by seventh grade students, and only 85% by thirteenth grade students. The use of the word, "mastery", might also be questioned. What teacher has not observed the child say, in the classroom, "I haven't any", and a few hours later on the playground, "I ain't got none"?

If training in formal grammar produces so little effect upon the language usage of the student while he is undergoing such education, how much effect might such previous training be expected to have upon the language usage of adults who are no longer attending classes? Such a group should indicate the final result of the many hours spent in class rooms dedicated to the teaching of English.

The present study attempts to determine the relative importance, in a group of teachers of adult education, of a certain number of factors which might conceivably affect English usage. These factors are:

1. Extent of formal education
2. Age
3. Previous major occupation
4. Years spent in former occupation
5. Race

6. Size of community in which major portion of childhood was spent
7. Father's occupation
8. Foreign or native birth of parents

Measures of English usage were secured, in terms of recognition of errors in grammar in printed material, from a test of English fundamentals constructed by the author. The Spearman–Brown coefficient of reliability of the test was .98, and the coefficient of correlation between the test and the New Stanford Achievement Test, was .75.

The data used in this study were obtained from 854 adults employed by the Work Projects Administration in Illinois as teachers on the Adult Education Program.* Because such a group of individuals might be expected to be highly selected, information concerning the background of these individuals is presented. The WPA employs many thousands of individuals drawn from many groups, even though all are at present on the relief roles. Furthermore, the Adult Education Project tends to secure the most capable of those employed by the WPA. Table I, giving frequency distributions of these teachers by various categories, indicates the extent of heterogeneity of background present in this group.

Part A of Table I shows that less than one third of these teachers had previous experience as teachers. One hundred and twenty-five different previous occupations, including such occupations as aviator, beauty operator, dancer, editorial writer, embalmer, lawyer, maid, minister, plumber, sculptor, truck driver, welder, waitress, and X-ray worker, to mention only a few, were reported by these teachers. It must be remembered that the WPA Adult Education Program was established to meet a variety of educational needs of underprivileged individuals. Consequently, there is a wide range of teaching fields, as evidenced by Part D of Table I. The frequency distributions of age and education indicate wide differences among individuals in these aspects. The individuals were drawn from all geographical areas of the state of Illinois, and are representative of rural, urban, and industrial conditions.

Evidence has been presented, then, to show that, if not completely representative of a general population, the individuals concerned in this

* The English test was administered to the WPA teachers to secure a basis of information upon which to construct correspondence courses, sponsored by the Division of University Extension, University of Illinois, leading toward improvement of English in these teachers. WPA clerical help was used in scoring the tests.

TABLE I

FREQUENCY DISTRIBUTIONS OF W.P.A. TEACHERS IN ILLINOIS BY PREVIOUS OCCUPATIONS, AGE, EDUCATION, AND PRESENT TEACHING SUBJECTS

A		B		C		D	
Previous Occupational Group	N	Age	N	School Level Attained	N	Present Teaching Subject	N
Arts	35	60–65	32	Graduate	31	Arts	63
Crafts and Trades	140	54–59	56	16	86	Citizenship	161
Commercial	180	48–53	117	15	56	Commercial	112
Housewife	53	42–47	125	14	123	Elementary	132
Labor	110	36–41	159	13	94	Nursery School	123
Profession (other than teaching)	76	30–35	158	12	227	Parent Ed. and Homemaking	117
Teachers	260	24–29	149	11	50	P. E. & Health	38
	854	18–23	58	10	61	Vocational	108
			854	9	25		854
				8	78		
				7	16		
				6	7		
					854		
Mean		38.62 years		.38 years			

study are, at least, more heterogeneous than might at first thought be supposed.

EFFECTS OF EXTENT OF EDUCATION, AGE, PREVIOUS OCCUPATION, AND YEARS SPENT IN PREVIOUS OCCUPATION UPON ENGLISH USAGE

In order to determine certain aspects of the relationships between the variables, product-moment coefficients of intercorrelations were computed, and are given in Table II.

Of the coefficients of correlation between English usage and the other variables, only two can be considered to be significant, namely: the correla-

TABLE II

COEFFICIENTS OF INTERCORRELATION BETWEEN MEASURES OF ENGLISH USAGE, EDUCATION, AGE, PREVIOUS OCCUPATIONS, AND YEARS SPENT IN OCCUPATIONS

	1	2	3	*4	5
1. English		.40	.04	.46	—.13
2. Extent of Education			.18	.52	—.08
3. Age				.19	.57
*4. Previous Occupation					.03
5. Years spent in Previous Occupation					

* Sigma values given in the Brussel-Barr Occupational Scale were used as scores in computing the correlations between previous occupations and the several variables. (1)

tions between English and extent of education, and English and previous occupation. Although statistically significant, these coefficients do not evidence a great amount of relationship between English usage and education or occupation.

Because the zero order intercorrelations indicate that at least some of the variables have higher coefficients of correlation among themselves than they do with measures of English usage, it was considered desirable to employ the technique of partial correlation, by means of which it may be determined what the correlation between any two variables would have been had other variables been held constant. This, of course, involves the assumption that the correlation between *a* and *b* is the same for each value of *c* (the variable held constant). If this assumption does not hold, however, the partial correlation may be considered as a sort of average.

Table III gives the partial correlations based upon the intercorrelations reported in Table II. The subscripts of the various coefficients in Table III refer to the variables listed, under the same numbers, in Table II.

Table III

Partial Coefficients of Correlation in Which Measures of English Usage is the First Variable

First Order Coefficients

$r_{12.3} = -.401$	$r_{12.7} = -.035$	$r_{13.2} = -.322$	$r_{14.2} = -.461$
$r_{12.4} = .213$	$r_{13.4} = -.054$	$r_{13.7} = -.186$	$r_{14.7} = -.467$
$r_{12.5} = .394$	$r_{13.5} = .140$	$r_{13.4} = -.162$	

Second Order Coefficients

$r_{12.34} = .220$	$r_{12.36} = -.076$	$r_{14.23} = .327$	$r_{15.24} = -.107$
$r_{12.35} = .375$	$r_{12.37} = .035$	$r_{14.25} = .334$	$r_{15.27} = -.142$
$r_{12.45} = .198$	$r_{13.45} = .048$	$r_{14.35} = .454$	$r_{15.34} = -.160$

Third Order Coefficients

$r_{12.345} = .193$	$r_{14.235} = .331$
$r_{13.245} = .009$	$r_{15.234} = -.120$

Of particular interest, among the partial coefficients of correlation given in Table III, are those between English usage and extent of education, and English and previous occupation. It will be noted that, by holding previous occupation constant, the zero order coefficient of .40 between English and education becomes .213. This is reduced to .193 when age and years spent in previous occupation are also held constant along with previous occupation. There is thus a reduction of 20.7 points from the zero order coefficient of .40 between English and education.

On the other hand, holding education constant, the zero order coefficient of correlation of .46 between English and previous occupation is

reduced to .322. When age and years spent in previous occupation is also held constant, the coefficient becomes .331, a reduction of 12.9 points from the zero order coefficient of .46 between English and previous occupation.

Although education is, to a considerable extent, prerequisite to entrance in many of the occupational categories, the foregoing evidence indicates that occupation shows greater relationship with English usage than does formal education.

The coefficient of correlation between age and English usage is practically zero, becoming smaller as the other variables are held constant. In no instance is it statistically significant. The coefficient of correlation between English and years spent in previous occupation is negative, although too small to be significant. This coefficient shows only slight change when the other variables are held constant.

The third order partial coefficient of correlation of .193 between English and extent of education is evidence of very little relationship between these variables. It should be reiterated at this point that this coefficient indicates the relationship between education and English usage long after, on the average, formal education was concluded. Two possible criticisms might well be raised. First, that, on the average, these individuals underwent their formal training anywhere from twenty to thirty years ago. Schools have improved in the interim and the results found with adults today might not be true of adults of the same average age twenty years from now. Second, the conclusions drawn are based upon data secured long after formal education was completed. It is hardly just, it might be said, to criticize the effects of education after other environmental agencies have had so long to influence the quality of expression. However, age is, to a considerable extent, a measure of the duration of time the individual has been removed from formal education. If different results presumably would be secured if individuals were measured while in school, then age should show a negative correlation with measures of English usage, as the distribution of age of the subjects ranged from those who had just completed their education to those who had been removed from the halls of learning for a considerable time. Table II indicates, however, that the zero order correlation between these variables is practically zero. Furthermore, Table III shows that holding age constant does not change the correlation between English and education. Thus it would appear that the relationship between

English usage and extent of education found in adults is similar to that which would be expected with children.

Insofar as these results can be taken as true for a general population, one might well question the extent to which English teachers (as well as formal education in general) have even begun to reach their objectives of bringing about in all individuals patterns of correct expression. If education is to play a more functional part in aiding in the development of better habits of expression, further work is necessary to determine, as far as possible, the effect of many other environmental factors upon expression. To the extent to which teachers are ignorant of the relative importance of these factors, little headway will be made in improving our methods of teaching grammar and expression.

Race

Of the 854 teachers composing the group used in this study, 148 were negroes. Because of the possibility of race acting as a factor upon English usage, the mean English scores and extents of education of the two racial groups were secured and are given in Table IV.

TABLE IV

MEAN ENGLISH SCORES AND EXTENTS OF EDUCATION BY NEGRO–WHITE GROUPS

	Negro	White
N	148	706
Mean English Score	117.11	131.78
S. D.	35.6	29.4
Mean School Level Attained	13.21	12.23
S. D.	2.1	2.6

Table IV presents certain interesting results. The negroes had had more formal education, on the average, than the whites. The difference between the means was .98 of a year and the critical ratio of this difference, computed by the formula, $\frac{D}{\sigma_D}$, was 4.52, indicating that this difference was statistically significant. Even though they had had more formal education, on the average, the negroes were inferior in English usage to the whites. The difference between the mean English scores was 14.67 points, and the critical ratio of this difference was 4.57, again indicating the statistical significance of the difference in mean scores.

That the negroes had had more formal education than the whites is certainly an atypical situation. Because the better educated negro often finds difficulty in securing employment commensurate with his training, there has tended to be a better selection of teachers, from the standpoint of extent of education, on the WPA Adult Education Program from the negro population than from the white population. This may explain the difference in mean school level attained by the two groups.

The differences in mean English scores is not so readily explained. Before a race factor may be postulated, the effects of various environmental factors should be studied. Information may readily be secured indicating that the environment of the negro in the South is customarily more detrimental to development than is the environment of the negro in the North. Wilkerson's (3) recent study indicates the extent to which the segregated negro schools in the South are inferior to white schools in educational quality. Other environmental factors might be presumed to be equally inferior.

Accordingly, the geographical location of the elementary education of the negroes in this study was taken as one approach to the problem of determining causes for the differences found in mean English scores. Thus a distinction was made between those whose childhood and early adolescence was spent in the South, and those who were brought up in the North. Of the 148 negro teachers, data concerning the geographical areas in which they spent their childhood were available for 135 teachers. Of these, 68 came from the South sometime after the completion of their elementary education, and 67 were either born in the North or came in infancy or early childhood. The mean English score for those raised in the North was 126.96. The mean English score for those brought up in the South was 109.15. There was thus a difference of 17.81 points between the means of the Northern and Southern negro groups. This difference was, furthermore, statistically significant as evidenced by a critical ratio of 3.20. The difference between mean school level attained for the north-south groups was too slight to have any significance, the northern group having attended school .08 of a year longer, on the average, than the southern group. The mean English score for the northern negro group was, furthermore, only slightly below the mean English score for the white group. Presumably this difference may also be explained by environmental differences.

Evidence has been presented indicating that differences in English usage found between a white and a negro group can be explained on the basis of the exceedingly poor environmental conditions affecting the negroes, especially in the south.

The question might be raised as to whether the inclusion of the negro group in the total group used in securing the intercorrelations between measures of English usage, extent of education, previous occupation, years spent in previous occupation, and age, accounted for the results found. The correlation between English usage and extent of education for the entire group was, it will be recalled, .40. The same coefficient of correlation for the white group alone was .44. The difference between these coefficients of correlation is slight. Certainly it is not great enough to postulate material changes in the conclusions reached.

ADDITIONAL FACTORS

The foregoing data have indicated the relatively small weight that extent of education, occupation, age, etc., play in determining English usage among adults. A slight amount of additional information concerning certain factors in early background was available for one hundred and eighty-seven of the teachers comprising the total group measured. This information covered the sizes of communities in which they spent the major portions of their early lives, whether either or both parents were foreign-born, and their fathers' occupations. Each of these factors was treated to see if any further light could be thrown on the problem of this study. Table V gives the mean English scores and school levels attained, by size of community in which teachers spent their childhood.

TABLE V

MEAN ENGLISH SCORES AND SCHOOL LEVELS ATTAINED BY TEACHERS—BY SIZES OF COMMUNITIES IN WHICH MAJOR PORTIONS OF CHILDHOODS WERE SPENT

Size of Community	N	Mean English Score	S. D.	Mean School Level Attained
1. Farm	23	127.50	19.23	12.84
2. Town under 1,000	30	104.46	26.74	12.00
3. Town between 1,000 and 10,000	85	122.32	25.79	11.91
4. City between 10,000 and 50,000	26	123.96	22.85	12.24
5. City over 50,000	23	124.52	20.76	12.26

While the number of cases was too few to draw many conclusions, it was found that those who spent their childhoods in towns under 1,000 scored appreciably lower in English than did the other groups, even though the amount of education was fairly close to that of the other groups. The farm group had the highest mean English score, but also the highest mean years of education, possibly explaining why they were higher than those in towns under 1,000 population.

In the case of 38 teachers, their parents were of foreign birth. The mean English score of this group was 118.81 points, and the mean school level attained was 12.0 grades. In 149 cases, the parents were native-born. The mean English score of this group was 120.88, and the mean school level attained was 12.16 grades. The difference between the two groups in mean English score was slight and not statistically significant.

Using again the sigma values given in the Brussel–Barr Occupational Scale, a product-moment coefficient of correlation was computed between father's occupation and individual's English score, and was found to be .005. This coefficient of zero is lower than might be expected. However, when the fathers of many of these adults were living and active, communities were smaller with the result that there was not as many different occupations or other diverse environmental conditions as would be found in larger cities.

SUMMARY

The results of this study indicate very clearly (1), the comparatively large number of factors that affect the English usage of individuals; (2), the relatively little weight any one factor, taken in isolation, has upon such usage; and (3) the small effect of formal education upon English usage when measured in adults. Certainly any belief that the formal teaching of grammar will alone bring about adequate English usage must be discarded. For the school to be more effective in this area, further knowledge of the factors affecting English usage must be secured, and the teaching of English changed in light of this information. Little attempt has been made to do more than determine the extent of recall of knowledge of grammar taught in the class room. More work must be undertaken to determine the importance of a host of other factors that form the patterns of speech usage of the child.

BIBLIOGRAPHY

1. Blair, Glenn M. "Mentally Superior and Inferior Children of High School Age." Columbia University, N. Y., 1938. Teachers College Contribution #766.
2. O'Rourke, L. J. "Rebuilding the English Usage Curriculum." The Psychological Corporation, Washington, D. C. 1934.
3. Wilkerson, D. A. "Special Problems of Negro Education." The Advisory Committee on Education. Office of Education, Washington, D. C., 1939.

SPELLING DISABILITY CORRELATES II—FACTORS THAT MAY BE RELATED TO SPELLING DISABILITY

GEORGE SPACHE
Friends Seminary, New York City

Editor's note: To make the leadership efforts of the teacher as effective as it should be teachers need to know more about the factors conditioning pupil growth and achievement. The author presents a survey of the situation in the field of spelling.

IN THE preceding article, the writer summarized the indications of recent research on factors that are clearly causal in spelling disability. There are apparently equally as many factors which, although definitely related to spelling success, have not been proven to be significant or causal. Again, the discussion of the factors is divided into the areas of the physical, the intellectual and temperamental, the subject matter and the miscellaneous.

I. PHYSICAL FACTORS

A. Visual Perception

Several writers are quite definite in their concept of visual perception as an important factor in spelling and reading success. For example,

Gates says, "Inadequate visual perception of a word is the most common type of difficulty in spelling" (44).

Sister Mary says, "In the acquisition of spelling and the mechanics of reading, perception is a more important factor than 'general intelligence' as measured for purposes of this study" (92).

Carmen believed, "The ability to spell requires a special type of ability to notice small differences between words . . ." (18).

Wells (141) and Floyd (37) each attributed three of their spelling cases to lack of attention to details and two to poor visual memory. Gilbert's (52) and Abernethy's (1) studies of eye-movements indicated that some spelling difficulties may be related to faulty eye-movement habits in perception of word forms.

A relative idea of the significance of visual perception, which may be defined as the attention to the visual characteristics of words, figures and digits, may be gained from the correlations between tests of this ability and spelling. A number of such correlations are given in Table I.

TABLE I

CORRELATIONS BETWEEN VISUAL PERCEPTION AND VARIOUS OTHER VARIABLES

Author	N	Grade	r	Variables
Acomb (2)	380	III–VI	.76	Spelling—Recognition of a word among similar.
Gates (45)	310	I-VI	.544	Composite spelling—perception tests involving words, intelligence constant
	310	I-VI	.41	Composite spelling—Stanford-Binet Mental Age
Hartmann (61)	63	Coll.	.39	Spelling—Recognition of a word among others
Sister Mary (92)	62	IV	.606	Perception tests of words or letters—Morrison-McCall Spelling
	62	IV	.549	" " " " " —Stanford Spelling
	48	V	.599	" " " " " —Morrison-McCall
	48	V	.641	" " " " " —Stanford Spelling
	62	IV	.314	" " " " " —Dearborn Intelligence
	48	V	.309	" " " " " " "

The data of Table I suggest 1) that tests of visual perception involving letters or words are moderately related to spelling, 2) that such visual perception is more closely related to spelling than to intelligence and 3) that it is more closely related to spelling than intelligence is. Both Gates (44) and Sister Mary (92) found that a visual perception test demanding discrimination of small differences between real words was more closely related to spelling than tests of discrimination between digits, geometric figures, designs, etc. But Hartmann (61) reports no real difference between groups of good, average and poor spellers in such a test.

Despite the association between certain types of visual perception and spelling success, research clearly demonstrating that defect in this skill may be a causal factor in spelling failure is conflicting. Gates failed to find a single case in which he felt that poor general visual perception was associated with poor spelling. (44) Nor did he (44) or Hartmann (61) or Fildes (36) discover real differences between the mean scores of good and poor spellers. These results are rather at odds with Gates' previously quoted opinion that inadequate visual perception is a very common type of difficulty. It appears logical to conclude that if certain types of visual perception are closely related to spelling success, they are probably related to some extent to spelling failure. But whether lack of this skill may predispose to failure, whether it is coincidental or causal and whether the tests in present use are valid, remain to be proven.

B. Reversals

The presence of excessive reversals among poor readers has been established by a number of writers. There is apparently a single study of reversals among spellers, namely, that of Russell (117). He found a reliably greater number of reversals among poor spellers, in the Gates Isolated Words Test. Russell further concluded that this test was a serviceable instrument for spelling diagnosis.

The interpretation of reversals is, of course, dependent upon one's theory of their causes. There are a number of theories as to the origin of reversals, for which the writer may be referred to Orton (106), Monroe (97, 98) and Gates and Bennett (49). The more eclectic students of spelling and reading have come to consider reversals, like other errors, as symptomatic of failure rather than a cause. Several facts support such a view:

1. Reversals are common errors of almost all beginners in reading and gradually disappear as reading skill improves (24, 31, 8, 111).
2. The reversal tendency is highly inconsistent (63) and specific*.
3. Ordinary remedial instruction, without specific attention to reversals, results in their gradual diminution and often complete disappearance (8).
4. There is no more reason to believe that reversals are causal in poor reading or spelling than to believe other common types of errors, as omissions, are causal. No one has thought of attributing failure to omissions and yet these are as frequent as reversals.
5. The data of an earlier article has demonstrated that there is no real difference between good and poor spellers in the number or percent of reversals or transpositions in their misspellings (123).

It may be concluded that for the purposes of diagnosis in spelling, reversals are significant only as a symptom of the difficulty. The tabulation of the number and percent in the spelling errors of the child may prove helpful in understanding the difficulty if the amount is greatly in excess of the average. If the error is a characteristic of the child's spelling, some specific attention may prove helpful. But use of a test of reversals in reading, as employed by Russell (117) seems of little value.

* The writer's unpublished experiments with tests of reversal tendency in reading also indicate practically no relationship between this tendency and the actual number or percent of reversals in samples of the child's writing.

C. Handedness and Eyedness

Many experimenters have studied the significance of handedness, eyedness and mixed eye-hand dominance in reading. Apparently none have contrasted spellers in these characteristics. The theory of the significance of left-handedness is best phrased by Dearborn (28), who, probably because of the relatively large number of left-handed children among his cases, has suggested that such children have a strong tendency to right-to-left movements which conflict with the conventional movements of reading and writing. With the exception of the study by Lord, Carmichael and Dearborn (84), the evidence indicates no greater amount of left-handedness among poor readers. Such are the findings of Gates (43), Monroe (97), Cutright and Anderson (22), Pace (109), Ladd (77), Fendrick (33), Bennett (8), Gates and Bond* and Imus, Rothney and Bear**. Haefner (60) similarly discovered no real difference between the scholastic achievement of left- and right-handed children. The relation of the symptomatic error, reversals, to handedness has been determined by Gates and Bennett (59), Witty and Kopel (145), Phillips (111), Bennett (8), Hildreth (63, 64) and Woody and Phillips (147). The results of all indicate no consistent relation between reversals and left-handedness.

The data of Gates (43), Monroe (97) and Fendrick (33) indicate slightly greater incidence of left-eye preference among poor readers. Of these, only Monroe's differences are reliable. Moreover, Selzer (122) reports that the left-eyed actually excelled the right-eyed in speed of reading. Gates and Bond* report no consistent tendency for eye-dominance or single-eye superior acuity to be related to achievement in reading. Imus, Rothney and Bear** found no relation between eye dominance and reading achievement of college freshmen.

Mixed eye-hand dominance was reliably greater among the defective readers of Monroe (97) and slightly greater among the reversals group of Gates and Bennett (49). Teegarden (127, 128) concluded that mixed eye-hand dominance was less favorable to rapid progress in learning to read than consistent right or left dominance. However, Witty and Kopel (145, 146)

---

* Arthur I. Gates and Guy L. Bond, "Relation of Handedness, Eye-Sighting and Acuity Dominance to Reading", *Journal Educational Psychology*, XXVII (September, 1936), 450–456.

** H. A. Imus, J. W. M. Rothney and R. M. Bear, *An Evaluation of Visual Factors in Reading* (Hanover, N. H.: Dartmouth College Publications, 1938).

and Bennett (8) found no consistent relationship between reversal errors and mixed eye-hand dominance.

The lack of established validity of many tests of eyedness and handedness may readily account for the differing reports. The writer is inclined to agree with Betts (9) who says, ". . . there is no significant evidence to prove . . . the hypothesis that left-eyedness and right-handedness or any other combination of eyedness and handedness contributes to confusions in the language functions".

D. Congenital Defects of Special Cortical Areas

In educational literature, the concept of congenital word-blindness, or the inability to recognize or comprehend printed or written words because of lesion in the supramarginal gyrus of the brain, has frequently been attributed to Hinshelwood (66). In an excellent summary of available writings on aphasia, Meyers (95) reports such a concept in writings antedating Hinshelwood by at least 30 years. Regardless of its origin, many writers have uncritically accepted this "diagram-making" tendency to localize language functions into relatively independent centres and to attribute the loss or disturbance of these functions to lesions in these specific centres. Among those accepting congenital word-blindness or "alexia" as an explanation of some extreme cases of reading or spelling disability are Hollingworth (67), Dearborn (27, 28) and Wallin (138). Orton shares the belief in the localization of language centres altho he criticizes Hinshelwood's use of the term and concept "word-blindness". (108)

Reasons for the non-acceptance of this theory are:

1. Destruction of certain brain areas results in the assumption or relearning of some of the functions attributed to those areas by other areas. (Lashley 78, 79, 80) In other words, destruction of certain brain areas does not result in the loss of the functions commonly supposed to be localized therein, but in the assumption of these abilities by other areas.

2. The presence of aphasia does not necessarily imply the existence of a lesion within the quadrilateral space of Marie (the area designated as centres of various language functions). (Meyers 95). Or, in other words, specific language difficulties may be present without lesion in the areas in which these functions are supposed to reside.

3. Pathological processes outside this area may and frequently do produce speech disturbances. (Meyers 95)

4. The absence of aphasia does not preclude the possibility that a pathological lesion exists in this area. (Meyers 95) One may not presume

that the absence of disturbances of certain language functions indicates absence of a lesion in the areas in which these functions are supposed to be localized.

5. Lesions in the areas where they are supposed to give rise to receptive aphasias or emissive aphasias do not regularly manifest themselves in the expected manner. (Meyers 95)

Evidence such as this has led to the rejection of the theory that lesions in the areas in which the language functions are supposed to reside are sufficient explanation for some cases of extreme disability in reading or spelling. "Word-blindness" is rejected by such students as Freeman (40), Tilney and Riley (133), Gates (43), Burt (17), and Bronner (16). It has been the experience of all of these that, as Tilney and Riley put it, ". . . satisfactory proof that localized lesions, etc. were causal in difficulties in reading, spelling or other similar activities" is lacking.

E. Cerebral Dominance

Another neurological explanation of language difficulties is that offered by Orton (106, 107). In brief, the theory is that "engrams" or images of letters and words exist in each hemisphere of the brain. The two images are in opposite or reversed orientation to each other. The average person, in whom one hemisphere is dominant, learns to ignore the images from the other and reads and writes consistently in one direction, usually from left-to-right. In the disabled child, a clear-cut dominance of one set of images (or one hemisphere) is supposed to be lacking, hence the child may read or write in either direction according to the particular image dominant for the moment. Mirror-writing, mirror-reading, marked persistence of reversals and lack of clear-cut right- or left-handedness are, according to Orton (107) and Monroe (97), evidences of this lack of cerebral dominance. Several points may clarify the stand of others who do not attribute reading or spelling disabilities to such a cause:

1. The belief that word recognition is due to impressions or engrams residing in each hemisphere is unacceptable to most psychologists. (Gates 43)

2. If lack of hand dominance or mixed eye-hand dominance, which are supposed to indicate lack of cerebral dominance, were causally related to disability, they should prove differential items. The previous discussion of handedness and eyedness resulted in the conclusion that these bear no consistent relation to language difficulties.

3. If reversals, which are supposed to result from lack of cerebral dominance, were part of the syndrome indicating such a condition, they should be related to other symptoms such as mixed eye-hand dominance, lack of clear-cut handedness, etc. The earlier discussion of reversals demonstrated the lack of such relationship.

4. The theory implies that the ability to perceive words is specifically localized and unrelated to the perception of objects, figures, etc. Experimental evidence shows that this assumption is unwarranted for these types of visual perception are positively interrelated. (44, 45, 36, 92)

These facts do not disprove the possibility of such a condition as lack of cerebral dominance, but they do cause question of the significance of the symptoms supposed to indicate its presence. They therefore cast doubt on the validity of the entire hypothesis.

F. Age, Sex, Physical Maturation and Birth Order

It is axiomatic to note that spelling ability increases with grade and age. The fact that it may be related to sex is less frequently recognized. A survey by Nifenecker (102) evidenced that girls were superior to boys by an average of 4.5 percent. The girls were uniformly superior in each half grade from V–VIII. A sex difference manifests itself in the fact that the majority of the spelling disability cases of Wells (141), Floyd (37) and the present writer (123) were boys.

It should not be presumed that the predominance of boys is due to a very definite sex difference in spelling ability. Such differences are not universally evident, according to Ladd (77). Rather it is logical to presume that the lesser conformity and greater aggressiveness of boys results in more of them being referred as problems. In summarizing the analogous literature in the field of reading, Bennett (8) notes a preponderance of boys among those disabled and offers a similar explanation.

Betts (10) mentions that the interpupillary distance increases rapidly during the early school years requiring constant readjustment on the part of the child. Since girls mature more rapidly, the period of adjustment is shortened and any unfavorable influence lessened. The longer period of adjustment and greater disturbance among boys may be a partial explanation of their predominance among the disabled.

Anderson and Kelly (4) noted the birth order of 100 reading disability cases and 100 controls. Their figures evidence slightly less tendency for only

and eldest children to become disabled. Bennett (8) reports a tendency for the intermediate child to be less successful and for the eldest child to be more successful in reading. The lack of consistency and reliability of these differences between children of different ordinal position precludes the recognition of the factor as important.

G. Miscellaneous Defects

It may be that defects of the teeth, tonsils and adenoids, malnutrition, glandular disturbances, birth injuries or lesions have important relations to spelling disabilities. Physical examination of school children in various countries indicates that fewer than 10 percent are free from diseased teeth and gums. The percentages of carious teeth in various samples range from 33 to 98. However, the exact significance of abnormalities of the teeth in educational achievement is not yet known. (130)

Ayres is cited by Terman and Almack (130) as finding that carious teeth were more frequent among the dull than the average and more frequent among the average than among the bright. This does not demonstrate a causal relationship between defective teeth and inferior mental status. In the writer's opinion, this is but further evidence of the recognized inverse relation between incidence of physical defect and quality of intelligence. Two experiments have been planned to determine the influence of proper care and treatment of the teeth upon achievement. Wallin is quoted by Terman and Almack (130) as reporting that 27 retarded children showed marked improvement in a number of tests at the end of a year in which particular attention was given to the care and repair of their teeth. The lack of a control group prevents determining the significance of these results. Chambers (19) found no consistent relation between correction of dental caries and gains or losses in achievement. That severe dental conditions may play a causal role in personality difficulties is exemplified in the case cited by Terman and Almack (130). Relief of impacted teeth resulted in the disappearance of nervousness, irritability, incorrigibility and habits of stealing and lying in the instance concerned.

Malnutrition, infected tonsils and adenoids and tuberculosis are also present in a relatively large number of school children. Terman and Almack (130) conclude that 10–15 percent suffer from malnutrition, 15–20 percent are predisposed to tuberculosis, approximately 12½ percent have infected tonsils and 8 percent infected adenoids. These authors offer con-

siderable evidence of the greater incidence of these handicaps among retarded children. Mateer (93) gives evidence of the significance of pituitary deficiences in certain cases of reading difficulty. Monroe (97) reports that 27 percent of her poor readers had suffered birth injuries, injuries to the head or diseases affecting the central or peripheral nervous systems. Only 20 percent of the good readers had suffered possible neurological injuries. None had experienced birth injuries. But the difference between the groups is not statistically reliable.

Anderson and Kelly (4) discovered immaterial differences between good and poor readers in age of learning to walk or talk, or in incidence of illnesses or accidents. Bennett (8) reports no real differences in his groups in illnesses or teachers' and parents' ratings of physical vigor. Were it not for the fact that the data of these and Monroe's study were based largely on the unreliable memory of parents, they might have caused serious question of the significance of such developmental information. Unfortunately, the point still remains in doubt.

The evidence of these studies of the role of physical defects in disabilities must be interpreted cautiously since the association of these factors is directly dependent upon the nature and extent of injury or defect in each individual case. However, it may be concluded, with ample basis, 1) that physical defects do tend to lower physical efficiency, 2) that their incidence is greater among the mentally and educationally retarded and 3) gross defects often play a causal role in individual cases of disability. This is sufficient to warrant effort to determine their presence and to initiate their correction in cases of spelling disability.

II. INTELLECTUAL AND TEMPERAMENTAL FACTORS

A. Various Single Mental Tests

Hartmann (61) reports an r of + .41 between spelling and a letter-digit substitution test and one of + .27 between spelling and a test of recognizing words in a page of pied material. There were no real differences between the mean scores of good, average and poor spellers. As previously observed, Baker (7) states that the median score of his poor spellers was below that of his entire group in his Orientation test. Kiefer and Sangren (74) note an r of + .69 between a test of reading backwards and spelling. Howell, et al. (71) say that their good spellers were markedly

superior in such a test. These various single mental tests probably measure elements of reading ability, attention and perception as well as mental ability. The presence of these would account for the association with spelling, in the writer's opinion.

There is little contribution to the understanding of spelling disability from the use of the single mental tests enumerated here. Their apparent association with spelling is probably due to the presence of elements already known to be related. Nothing of a diagnostic nature can be derived from the use of tests of letter-digit substitution, orientation, reading backwards, etc.

B. Various Memory and Association Tests

For convenience the memory and association tests employed in diagnostic testing of poor readers and spellers may be grouped under the categories of visual and auditory powers. In a test of visual memory for designs, good spellers were definitely superior according to Howell, et al. (71) Bronner (16) attributed the reading difficulty of one of her cases to poor "visual powers" evidenced by failure in a similar test. Garrison and Garrison (42) report an r of + .46 between a test of rote memory for geometric forms and spelling. Baker (7) employed a test of visual memory for objects with which he found good spellers, as measured by final marks, superior. Good spellers, as measured by the Stanford Achievement test, were superior and poor spellers inferior to the median score of the entire group on the same test. Hartmann (61) reports an r of + .78 between spelling and a test of visual memory span for unknown words. The group of good spellers was decidedly superior to average spellers and average spellers superior to poor spellers in this test.

Despite the marked association between certain types of visual memory and spelling, the evidence does not demonstrate that this relation is clearly direct. Unless such factors as mental and chronological age are held constant, the extent to which these latter are responsible for this association is unknown. Many of the tests of "visual powers" are widely used as measures of intelligence. Baker (7) reports an r of + .345 between Binet M. A. and his test of visual memory for objects. Unless other evidence is introduced, it may be argued that any observed relation between various visual memory tests and spelling ability is due largely to the influence of general mental ability and chronological age. Furthermore, C. T. Gray (58) has

shown that large perceptual spans were characteristic of more rapid readers only when meaningful material was employed and that the span was a product of early reading training and experience.

Spelling or language difficulties have been attributed to poor auditory memory by Bronner (16), Floyd (37) and Wells (141). Garrison and Garrison (42) offer correlations of + .39 between spelling and rote memory for digits, of + .31 with rote memory for words and of + .43 with rote memory for nonsense syllables. Baker (7) claims that his poor spellers, as measured by final marks, were inferior in auditory rote memory for unrelated words. Good spellers, as measured by the Stanford Achievement test, were superior in this test. Bond (14) noted that poor readers were significantly inferior in memory for digits, but normal in memory for nonsense syllables. Wallin (138), White and Poull (142) failed to find any evidence of defective auditory memory span among non-readers. Young (148) gives some idea of the significance of auditory retention by an r of + .80 between retention after listening to a single reading and retention after a single silent reading.

Altho the evidence supports some association of spelling ability and various types of auditory memory, it is vitiated by the fact that these same abilities are frequently considered indications of general intelligence. Baker (7) reports an r of + .33 between his test of auditory memory for words and Binet M. A. Since auditory memory, spelling ability and mental age increase simultaneously, it is quite possible that observed relationships between the first two are a reflection of the influence of the third. The same critical reception must be accorded other memory tests. Garrison and Garrison (42) found an r of + .34 of spelling ability with a test of logical memory. Kiefer and Sangren (74) report r's of + .57 of spelling and rote memory in learning foreign words and of + .80 with an undescribed recall test.

Gates (43) has offered several association tests for use in diagnosis of reading difficulties. For the first of these, termed an "auditory-visual" association test, he gives correlations with spelling ability of + .30, + .13 and + .22. For the second test, termed a "visual-visual", he gives r's with spelling ability of + .40, + .08 and + .24. (45) Using a similar auditory-visual learning test, Monroe (97) reports that the reading-defect cases were inferior to the controls, altho the latter were younger mentally and chronologically. Bond (14) found good readers superior in the same test. But

Sears* failed to find that a group of high grade mental defectives with severe reading disability differed from normals in both Gates' tests. He concluded, "Deficiencies in the abilities measured by these tests are seldom significant causes of reading disability." His own coefficients and the conflicting evidence of their significance has probably led Gates to modify his original position with respect to these tests, as follows:

". . . there is much less tendency today than formerly to assume that serious disability in reading is the result of a specialized disability in memory, visual imagery, auditory imagery, imagination, associative capacity, or other such processes." (47)

C. Imagery

Fernald (34) considers the main peculiarity of poor spellers a lack of visual imagery. Baird (6) concluded that motor imagery was the most important factor in spelling success. Of opposite opinion are Gates (44), Wallin (138) and Kiefer and Sangren (74). Gates considers visual imagery a mystery that cannot be tested reliably in children. He feels that its lack is not a cause in reading or spelling defect. Wallin found no defects in auditory or visual imagery in poor readers. Using a questionnaire attributed to Betts, Kiefer and Sangren discovered little relation between types of imagery and spelling ability. In the absence of supporting evidence, the writer is inclined to agree with Gates. If visual perception is what is meant by "visual imagery", its significance has already been discussed. If visual imagery implies individual images of words, the concept is similar to the "engrams" of Orton and discarded by most present-day psychologists.

D. Personality Traits

Miscellaneous undesirable personality traits commonly attributed to children experiencing spelling or reading difficulties are:

Betts—dislike, instability, poor attention, lack of motivation (9)
Baker—timidity and aggressiveness (7)
Gray—nervousness, self-consciousness, timidity (56)
Hincks—behavior was peculiar—eccentric, irrational or antisocial (65)
McCallister—nervous and excitable temperament, extreme timidity, indifference (89)
Orton—apathy, inferiority and mild paranoid reactions (107)

* R. Sears, "Measurements of Associative Learning in Mentally Defective Cases of Reading Disability. Evidence Concerning the Incidence of Word-blindness", as quoted by Betts (9).

Before it is possible to determine whether certain traits cause, or are caused by, or are merely coincidental to educational disability, three facts must be established, namely, 1) the incidence in comparable normal groups must be shown, 2) whether the traits antedate, accompany or follow the disability and 3) whether improvement in personality adjustment accompanies removal of the disability.

The variability of the measures and terms used in the study of personality adjustment and the lack of standards for normal adjustment hamper any attempts to compare normal and disabled groups. Evidence is offered by Monroe (97) that poor readers manifested more school problems, temper tantrums, day dreaming and enuresis than other clinic cases. They evidenced less stealing, incorrigibility, sex offenses and disobedience than the same controls. The reliability of this comparison, as Monroe notes, is somewhat doubtful since the comparison was based on the traits noted by the agency or parent referring the child. Ladd (77) reports that there was a slight tendency for good readers to have a greater sense of happiness and achievement in school, better self-control, more persistence and less quarrelsomeness. Bennett (8) discovered no real differences, by use of a questionnaire, in the reactions to social situations or such traits as temper, obedience or talkativeness as judged by parents and teachers. There was a real difference in persistence, as judged by teachers, in favor of the good readers. There was also a tendency for more readers to express atypical feelings such as restlessness, indecision, loneliness, fearfulness and stuttering. With the exception of Bennett's indications that a group of poor readers was somewhat more neurotic than their controls, and the slight tendency toward less persistence noted by Bennett and Ladd, the evidence seems to confirm Olson's observation that, ". . . most efforts to measure emotional factors result in scores showing negligible correlations with achievement". (104)

It is also difficult to establish whether certain traits antedate, follow or are coincidental with disability. Bird (11) found that 30 children suffering from such handicaps as shyness, distractibility, craving for attention or praise took longer to master reading than the remainder of a group of 100, altho equal in intelligence. To some extent, this demonstrates that hampering traits may antedate difficulties as well as further complicating them. Gates (43) and Hincks (65) also believe that maladjustment is very apt to be caused by a disability, altho they do not disavow the possibility of an inverse

relationship. Fendrick and Bond's (33) conclusion that because poor reading ability was present in a group of delinquents there is some association between these factors, is an example of the common faulty reasoning that because two factors are coexistent they are interrelated.

The improvement of emotionally maladjusted children as a result of remedial instruction should give a clue to the nature of the relation existing between certain traits and disability. Rather conflicting reports are given by Kirk (75), Richards (116), Hosey (69) and Damerau (23) among others. The first three claimed distinct improvement in personality after remedial reading training. But, a follow-up study of 22 children by Damerau showed little relation between better behavior and improved reading. In over half the cases, improvement in one factor was not accompanied by improvement in the other. Similarly, Hincks (65) believes that where there is a definite personality maladjustment, improvement in reading does not relieve the condition.

To summarize the role of hampering traits in disability, it appears difficult to establish differences between normal and disabled children, with the possible exceptions of lack of persistence and some tendency toward neuroticism and offenses of a less aggressive nature. Evidence is offered that certain traits may precede and further complicate disability, while authoritative opinion indicates that the traits are more often an accompaniment or result. Improvement in personality may or may not follow remedial work, probably in accordance with the instruments of personality measurement employed and the extent of the maladjustment.

III. SUBJECT MATTER ACHIEVEMENT

A. Silent and Oral Reading

The writer has frequently used research from the field of reading to supplement that in spelling under the premise that there is a distinct relation between the two fields. This association may be established by the citation of statistical correlations between reading and spelling and, more directly, by data evidencing that spelling improvement results from reading experience. In Table II, a number of correlations are offered.

The median of the 41 coefficients is $+.62$, the mean, $+.603$. The median r's for single and several grade ranges may not be contrasted since there are only two sources for the former. There does not appear to be any

marked tendency for the association to vary with the grade for the median of the 19 r's in grades I–V is + .60. The median of the 5 r's for grades VI and above is + .41. The similarity between the median for the entire table and that for the first five grades suggests that the relationship is similar throughout the elementary school.

It may be concluded that a coefficient of approximately + .60 is typical of the association existing between reading and spelling. In most of the correlations, mental age has not been held constant, hence the observed relation may be dilated. If it is possible to judge by Merrill's data, in which mental age was controlled, the observed relation of approximately + .60 is not greatly inflated. The implication that may be drawn from the table is that there are probably a number of common determinants in reading and spelling success.

Gilbert's studies (53, 54, 55) evidence that the spelling of high school and college students improved incidentally as a result of their reading. The mere presence of spelling words in reading materials resulted in improved spelling, particularly for good spellers. This is direct evidence of the influence of reading upon spelling. Apparently the association between reading and spelling is due not only to common determinants but also to the direct influence of reading upon spelling.

The association of oral reading and spelling has been mentioned in the section on Speech and Pronunciation in the preceding article. As might have been expected from the fact that they were poorer silent readers, Russell (117) found poor spellers inferior in speech and rhythm of oral reading. Gates (44) reports an average r of + .50 between the Gray's Oral Reading test and spelling. This evidence permits the conclusion that the same common determinants which are responsible for the relation between silent reading and spelling manifest themselves in a moderate relation between oral reading and spelling.

IV. MISCELLANEOUS

A. Spelling Consciousness

Several writers have suggested that a critical attitude toward one's own spelling, or a spelling consciousness, would result in distinct spelling improvement. Certain data appear to support such a view. Hendrickson and Pechstein (62) found an r of + .68 between the accuracy with which

TABLE II

CORRELATIONS BETWEEN READING AND SPELLING

Author	N	Grade	r_{12}	Variables
Acomb (2)	380	III-VI	.83	Own reading—spelling tests
Gates (44)	40	VII-VIII	.48	Burgess Reading—composite spelling
	"	"	.38	Thorndike-McCall Reading— " "
Gates and LaSalle (51)	75	III-VI	.815	Composite reading—spelling tests, average of six correlations
Hartmann (61)	63	College	.47	Whipple Reading—own spelling
Merrill (94)	59	M. A. 8	.614	Stanford Ach. Paragraph Meaning–Spelling tests
	"	"	.638	" " Sentence Meaning— " "
	"	"	.773	" " Reading Total— " "
	86	M. A. 9	.704	" " Paragraph Meaning–Spelling tests
	"	"	.531	" " Sentence Meaning— " "
	"	"	.632	" " Reading Total— " "
	76	M. A. 10	.627	" " Paragraph Meaning–Spelling tests
	"	"	.636	" " Sentence Meaning— " "
	"	"	.607	" " Reading Total—
Monroe (97)	101	I-V	.81	Composite reading—Ayres, grade scores
	215	I-VIII	.85	" " " " " "
	155	II-VIII	.85	" " " " " "
Russell (117)	138	III-V	.379	Gates Silent, A, —Modern School Ach. Spelling
	"	"	.313	" " " D— " " " "
Sister Mary (92)	62	IV	.701	Stanford Ach. Reading—Morrison-McCall Spell'g
	48	V	.728	" " " " " "
	62	IV	.735	" " " —Stanford Spelling
	48	V	.787	" " " " "
	62	IV	.666	Gates Silent Tests—Morrison McCall
	48	V	.455	" " " " "
	62	IV	.721	" " " Stanford Spelling
	48	V	.543	" " " " "
	62	IV	.625	Sangren-Woody Reading—Morrison McCall
	48	V	.503	" " " " "
	62	IV	.631	" " " Stanford Spelling
	48	V	.519	" " " " "
Spache*	105	II	.58	Progressive Ach. Primary Reading Comp.–Spell'g
	181	II	.52	Metropolitan Ach. Primary II Para. Read.– "
	234	III-V	.59	" " " Intermediate " " "
	185	IV-V	.21	Progressive Ach. Elem. Read. Comp.– "
	364	IV-VI	.67	New Stanford Ach. Reading Comp.– "
	186	VI-VII	.36	Progressive Ach. Inter. Read. Comp.– "
	363	VI-VIII	.41	Metropolitan Ach. Advanced Reading– "
Terman (129)	100	III-VIII	.46	Stanford Ach. Paragraph Meaning– "
	"	"	.46	" " Sentence Meaning– "
	"	"	.57	" " Reading Total– "

* These correlations are obtained from the testing in Friends Seminary and Brooklyn Friends School, New York City where the writer serves as school psychologist.

students could judge the accuracy of their spelling and its actual accuracy. The students were good judges of correct words but not of incorrect words. Tidyman (132) reports that his pupils were unaware of when they misspelled words. The suggestion that the pupil determine the correct spelling of any word of which he is doubtful would, in the writer's opinion, result in a very minute improvement, if any. Since pupils usually presume that they have spelled correctly, and are unaware when they have erred, they would also be unaware of which spellings they should doubt.

B. Hygienic Factors

Physical conditions of the classroom may have some relation to school success. The writer doubts that any such factor could assume significant proportions in a subject matter disability. Like many of the minor factors, hygienic conditions of the classroom bear only a minute relationship to academic success.

Tinker (135) has shown that for continuous reading an illumination of 6 to 13 foot candles is desirable, depending upon the size of the type of the book. Visual acuity increased 67.7 percent when lighting was increased from 1/10 to 1 foot candle, 43.6 percent when lighting was increased from 1 to 5 foot candles and only 8.2 percent in the increase from 5 to 20 foot candles. Furthermore, Luckiesh and Moss (86) report that muscular tension was created by reading in inadequate light. Tension decreased as the intensity of illumination increased. Ferree and Rand (35) consider poor lighting a contributory factor to nearsightedness, nervous exhaustion and lessened efficiency. Six foot candle illumination appears almost a minimum requirement for ordinary reading.

Connelley (21) gives evidence that the position of children in the classroom affects their ability to profit from materials presented on flash cards, blackboards, etc. Pupils seated nearer the printed matter and toward the center of the room gained more than those seated toward the rear or sides of the classroom. The necessity of adequate illumination and, to a lesser extent, position in the classroom have been frequently stressed but the evidence cited here is somewhat more definite.

C. Methods of Study

Altho probably not of sufficient importance to assume a causal role in spelling difficulties, poor methods of study certainly interfere with spelling success. Gates (44) reports the following as characteristic of poor spellers, 1) spelling letter by letter, 2) spelling by minute phonetic units, 3) unsystematic division into various word units or incorrect syllabication and 4) spelling words by wholes. By the use of photographic records of eye-movements, Abernethy (1) and Gilbert (52) discovered that adult or superior spellers tend to study by syllables and to make an analysis of the difficult portions of words. Among others, Wells (141), Mitzefeld (96) and McCallum have noted the inability of poor spellers and readers to make a varied or analytic approach to new words.

Contrasts of the study methods of good and poor spellers have been made by Russell (117) and Atkins (5). By having the children do their studying out loud, Russell discovered that poor spellers tend to 1) say the word aloud, 2) to spell aloud letter by letter and 3) to spell aloud while looking at the word. Good spellers more frequently 1) wrote the word without looking at it, 2) spell orally by syllables, while looking at the word and 3) spelled by units. In none of these tendencies were the differences reliable. Saying the word aloud and spelling orally letter by letter were the most common techniques of both groups. In the time used and the number of different steps, good and poor spellers were not dissimilar.

Russell (117) also studied the success of the groups in the use of "visual, auditory and kinesthetic methods of study". Good spellers showed a significantly greater preference for one method to the exclusion of the other two. As measured by the successful spelling of three words, supposedly equal in difficulty, good spellers excelled in the use of each of the methods, the difference being wholly reliable in the auditory method. Good spellers were also superior in the use of blending, as judged by the examiners and in analyzing by syllables. Poor spellers more frequently guessed the word as a whole.

Atkins (5) determined the efficiency of methods of study of children by the number of words they were able to learn in a given time. The outstanding characteristics of the children at very high learning levels were 1) the use of a very systematic and well-organized plan of study and 2) the use of a number of the following: visualization, vocalization, transfer, writing words on paper while looking and writing words from memory. Children of low learning levels were distinguished by a lack of systematic method and self-direction. They used similar devices in studying but used them less frequently and effectively.

D. Types of Spelling Errors

It has been mentioned several times that the specific spelling errors of children experiencing difficulties may be a diagnostic aid. In an earlier article (123), the writer demonstrated that certain spelling errors differentiated good and poor spellers. The evidence was based on the mean number and percent of errors of 25 good and 25 average spellers of grades III–V. Briefly, the indications are:

1. When errors are classified as phonetic and non-phonetic, there appears a definite tendency for the average spellers to make a greater number and percent of phonetic errors than do the poor spellers. Conversely, there is an equally definite tendency for the poor spellers to make a greater number and percent of non-phonetic errors than do the average spellers.

2. Specific error types in which average spellers may exceed the poor in both number and percent to a significant extent are phonetic additions of single letters and phonetic substitution for a syllable.

3. Errors in which poor spellers may exceed in both number and percent to a significant extent are non-phonetic substitutions for a syllable, incomplete and unrecognizable spellings.

4. Altho not wholly reliable differences were found, there appears a strong tendency for average spellers to exceed in the number and percent of total additions. There is a strong tendency for poor spellers to exceed in the number and percent of omissions of sounded letters and of syllables, and in total non-phonetic substitutions.

The writer is not suggesting that the mere tabulation of spelling errors will provide sufficient insight to initiate extensive remedial procedures. But, undoubtedly the knowledge of the nature of the subject's errors is a supplementary diagnostic aid. Both Floyd (37) and Wells (141) used a tabulation of spelling errors successfully in their diagnoses and in the determination of appropriate remedial procedures. Extensive reviews of common systems of classification (125) and detailed suggestions for the use of the writer's classification of spelling errors (123, 125) are available.

INCREASING THE RETURNS FROM QUESTIONNAIRES

CLARENCE CARL MOORE
School of Education
Alabama Polytechnic Institute

Editor's note: Almost everyone has had the experience of using a questionnaire for some much needed information and has been disappointed by the meagerness of the returns. Many studies are largely invalidated by the fewness of the replies. The author suggests ways of increasing the number of questionnaires returned.

THE writer recently made a questionnaire study dealing with an evaluation of the curriculums offered to superintendents by institutions of higher learning. There were 494 questionnaires and the same number of check lists sent to superintendents. There were 117 check lists sent to institutions of higher learning. The questionnaires sent to superintendents were the conventional kind. They were one page in length and single spaced. This conventional type of questionnaire was accompanied by a check list type of questionnaire which was four pages in length and single spaced. The check list type of questionnaires sent to institutions of higher learning were four pages in length and single spaced. Because of the extreme length of these questionnaires, they would not be expected to give a high per cent of returns.

It was decided to accompany a part of the questionnaires sent to superintendents with a typewritten letter of transmittal, and to accompany a part of them with a duplicated letter of transmittal. It could then be determined which kind of letter produces the greater number of results and the extent of the difference.

The number of returns which had been received eight weeks after the sending of the questionnaires was determined. Eight weeks after mailing the questionnaires, a reminder was sent to each of those superintendents from whom returns had not been received. The additional returns from this reminder were also counted and tabulated.

The duplicated and the typewritten letters of transmittal contained the same message. All of the reminders contained the same message and they were all duplicated.

No separate count was kept of the number of typewritten or the number of duplicated letters of transmittal sent to institutions of higher

learning. The reminders sent to this group were all identical in message and form of reproduction.

The data contained in this article have no pertinent relation to the problem of the main study[1] except as the increased number of returns effected the amount of data available for it. This article is a by product of the main problem and deals only with the experiment concerning the questionnaires and the reminders.

There were two groups of superintendents obtained from each of the following states: Colorado, Nebraska, Wyoming, and Utah. The addresses of the members in one group were obtained from the names listed in the first half of a state educational directory and the addresses of the members in the other group were obtained from the names listed in the last half of the same educational directory.

Table I compares the results from the typewritten and the duplicated letters of transmittal, and the effect of the reminder on the number of questionnaires returned. Column 2 shows the number of each kind of letter of transmittal sent to each of the four states, the totals, and the grand total. Column 3 shows the number of each classification received before the reminders were sent. Column 4 shows the per cent that Column 3 is of Column 2, and the difference in per cents for the two classifications of each state. Column 5 shows the total number of questionnaires returned both before and after the reminders were mailed. Column 6 shows the per cent that the total questionnaires received are of the total number of questionnaires mailed. Column 7 shows the total number of reminders sent. Column 8 shows the number of reminders that prompted the recipients of these reminders to complete and return the questionnaires in their possession, and Column 9 shows the per cent that these effective reminders are of the total number of reminders mailed. Column 10 shows the per cent that the effective reminders are of the total number of questionnaires mailed. The returns in Column 10 are not purely the result of the reminders due to the fact that some of the questionnaires possibly would have been returned even though no reminders had been sent out. Judging from the number of returns received during the fifth, sixth, and

[1] Moore, Clarence Carl. "An Evaluation of the Curriculum Offered to Superintendents of Schools by Institutions of Higher Learning." *Unpublished Doctor's Field Study.* Colorado State College of Education, Greeley, Colorado.

TABLE I

A COMPARISON OF THE RETURNS FROM THE TYPEWRITTEN LETTER OF TRANSMITTAL WITH THE RETURNS FROM THE DUPLICATED LETTER OF TRANSMITTAL, AND THE EFFECT OF THE REMINDER ON THE NUMBER OF QUESTIONNAIRES RETURNED

Classification	Questionnaires					Reminders			
	Sent	Received before (a) reminder		Total questionnaires returned(b)		Sent	Effective		Effect on all lists mailed*
		No.	%	No.	%		Number	Per cent	
1	2	3	4	5	6	7	8	9	10
Colorado typewritten	83	52	62.7	70	84.3	31	18	58.1	21.7
Colorado duplicated	98	55	56.1	71	72.4	43	16	37.2	16.3
Difference in per cents			6.6		11.9			20.9	5.4
Nebraska typewritten	88	57	64.7	71	80.7	31	14	45.2	15.9
Nebraska duplicated	111	58	52.2	69	62.2	53	11	20.8	9.9
Difference in per cents			12.5		18.5			24.4	6.0
Wyoming typewritten	47	28	59.6	39	83.0	19	11	57.9	23.4
Wyoming duplicated	30	14	46.7	18	60.0	16	4	25.0	13.3
Difference in per cents			12.9		23.0			32.9	10.1
Utah typewritten	20	11	55.0	15	75.0	9	4	44.4	20.0
Utah duplicated	17	8	47.0	10	58.8	9	2	22.2	11.8
Difference in per cents			8.0		16.2			22.2	8.2
Total typewritten	238	148	62.2	195	81.9	90	47	52.2	19.7
Total duplicated	256	135	52.7	168	65.6	121	33	27.3	12.9
Difference in per cents			9.5		16.3			24.9	6.8
Grand totals	494	283	57.3	363	73.5	211	80	37.9	16.2

(a) The reminders were sent eight weeks after the questionnaires had been mailed.
(b) Includes the questionnaires returned before and after the sending of the reminders.
* The per cent that the number of questionnaires returned as a result of the reminders is of the total number of questionnaires mailed.

seventh weeks, the number that would have come in without the effect of the reminder would have been very small.

Table II shows the returns from institutions of higher learning. It also shows the effect of the reminders in getting questionnaires returned. This table is not as complex as the previous one, and it should be understood without interpretation.

CONCLUSIONS

The typewritten letter of transmittal is more effective in getting questionnaire returns than the duplicated letter of transmittal. The total of this effect as measured by the technics used in this experiment is equal to 16.3 per cent of the number of questionnaires mailed. The reminders sent to superintendents produced an increase of approximately 16.2 per cent in addition to the increased per cent produced by the typewritten letters. The reminders sent to institutions of higher learning brought in 30.8 per cent of the total questionnaires mailed in the first instance and were a factor in getting returns from 51.4 per cent of those questionnaires remaining unreturned at the time the reminders were mailed.

TABLE II

RETURNS FROM INSTITUTIONS OF HIGHER LEARNING

Classification	Number	Per cent
Check lists sent	117	100.0
Check lists received after a period of eight weeks	47	40.2
Total check lists received	83	70.9
Reminders sent	70	100.0
Effective reminders	36	51.4
Effect of reminders on total check lists mailed	36	30.8

EDITORIAL

THE TIME, MONEY, ENERGY FACTOR IN EXPERIMENTAL EVALUATION

THE slowness with which advances in theory are incorporated into practice has been frequently remarked upon. There have been many reasons advanced for this slowness but it appears in these discussions that insufficient emphasis has been placed upon the time-money-energy factor.

In examining current researches from this point of view it seems that experimenters almost always aim to determine whether a given course, activity, or technique is effective or more effective than another without carefully considering the time, money, and energy involved. One course, activity, or technique may be more effective than another but it may also cost more. How much time, money and energy is the reputed extra value worth? Theoretically we desire only the best; practically, however, our schools are very limited in means by which they hope to maintain an effective program. There are many very real scarcities in the school world and these force those responsible for the school's program to consider relative values. A course, activity, or technique highly desirable in an utopia may be out of the question in the world of every day realities in which the school attempts to operate. Out side the classroom one frequently purchases the less expensive of two objects because the less expensive seems adequate for the purposes for which it is to be employed; the less complicated because one may not feel equal to the more complicated; and the time saving because time is often a consideration. Teachers working under the practical conditions can seldom overlook these time, money and energy aspects of the situation.

A point has frequently been made of the importance of testing the findings of laboratory research under the less well controlled conditions of the classroom. Many schools have such a program of continuous testing under way. It is hoped that those responsible for this program will consider not merely the absolute value of the courses, activities, and tech-

niques investigated, but their value in relation to the time, money, and energy expended. To convince teachers of the worthwhileness of proposed changes in educational practice, experimenters must not only show that the proposed changes work but that they work under the conditions under which teachers work. Not only must experimenters answer the question "Is the proposed innovation of value to the child?" but also, "Will it save time for the teacher?" "Is it easier and less energy consuming?" "Will it save money by dispensing with valuable equipment?" Etc. Similar questions might be asked from the point of view of the pupil. Many of the theoretical discussions of educational problems and some considerable part of the research in this area neglect these very important considerations.

A. S. BARR.

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

MASON, CARLETON D. *Adaptations of Instruction to Individual Differences in the Preparation of Teachers in Normal Schools and Teachers Colleges.* Contributions to Education, No. 793. New York: Bureau of Publications, Teachers College, Columbia University, 1940. Pp. xiii + 279. $2.50.

For more than a decade individualization in instruction has been recognized as one of the important problems confronting educators in elementary and secondary schools. Recognition of the significance and importance of this problem on the college level is of more recent origin. This study is a report of the present status of the methods used in teacher training institutions in adapting instruction to the individual needs of students. The author in his consideration of this problem asserts that schools that stress individualization tend to emphasize the development of the students in self reliance, initiative, independent thinking, judgment and a critical attitude.

Data for this study were gathered from 51 teacher training institutions by the use of questionnaires listing twenty-five instructional adaptations used in liberal arts colleges. The questionnaires were sent to the administrative officers in an effort to determine the difficulties encountered in making the adaptations. Another form of the questionnaire was sent to the instructional staff in each institution in an effort to determine what adaptations were used and how effective they felt they were. Returns were obtained from 1997 instructors. A third form was submitted to the students in an effort to determine their likes and dislikes. Tabulations were made from 528 returns.

Considerable variability in the use of the techniques was found among the institutions and between the different departments in the several schools. It was found that the adaptations were in the nature of supplementary aids for purposes of remediation rather than basic methods of instruction. Conferences, projects, term papers and laboratory work accounted for approximately 70% of the adaptations with the personal and group conference used by more than 50%. The leading benefits ascribed to the adaptations are increased achievement, motivation and interest. Better student-teacher relationship, provision for individual needs and improved student attitudes ranked high among the twenty-six benefits listed.

The major difficulties encountered by the instructors in the use of the techniques were lack of time, the type of student and the cost. The intellectual immaturity of many of the students was cited as a handicap in the use of independent methods of instruction. The students disapproved of sectioning, thought that term papers were of doubtful value, expressed a desire for more freedom and

felt that much of their instruction was on the high school level.

The author concludes that the techniques have in the main been rather unsuccessful due in large part to the inadequate preparation and a laissez faire attitude on the part of the teaching staff. An improved instructional staff and a better selection of students are suggested as remedies.

The questionnaire forms used in the study were not reproduced in the volume hence an evaluation of the reliability of the data or the validity of the conclusions can not be determined. While the study reveals no new truths it does serve to verify the assumption generally recognized with respect to present practice in college teaching and as such it represents an important first step for improvement and further study.

T. L. TORGERSON.

University of Wisconsin

NOLL, VICTOR HERBERT. *The Teaching of Science in Elementary and Secondary Schools.* New York: Longmans, Green and Company, 1939. Pp. VIII + 238. $2.00.

This methods book gives a very complete survey of the problems in the teaching of science. The first two chapters are devoted to a discussion of the aims in the teaching of science. The aims selected are based on the summary of the aims listed in several investigations. The third chapter gives a very thorough review and discussion of the scientific attitude, an aim much neglected in our science teaching. The first part of this chapter is devoted to an analysis and description of the scientific attitude, followed by methods for developing the scientific attitude and illustrations of tests used for measuring the scientific attitude.

Many teachers will probably not agree with the author's definition of a scientific attitude. It is questionable whether there is one scientific attitude. It is also questionable whether the scientific attitude is the same thing as scientific thinking.

In chapter four, the author gives a summary of the results to be expected in using the following methods of teaching, such as the laboratory, demonstrations, field trips, excursions, drawings, visual aids, workbooks, laboratory manuals, and methods for providing for individual differences.

The latter part of the book deals with problems of curriculum construction in the elementary school and the junior and senior high schools and the measurement of achievement in science. The author gives an excellent summary of the purpose of tests and how they are to be used in classes, also a complete list of tests which are available. The final chapter gives a list of qualifications demanded of good science teachers.

Each chapter includes a list of questions and problems for discussion and a very complete bibliography. The appendix gives a complete statistical summary of several tests in science.

IRA C. DAVIS.

University of Wisconsin

BROWN, H. EMMETT. *The Development of a Course in the Physical Sciences for the Senior High School of the Lincoln School of Teachers College.* New York: Bureau of Publications, Teachers College, Columbia University, 1939. Pp. ix + 205. $2.25.

This study was undertaken to develop course materials in the physical sciences for the two last years of the senior high

school of Lincoln School Teachers College. The first step was the setting forth of an educational philosophy, the second to show how this philosophy may be applied, and the third to develop a course which might represent this philosophy in a concrete teaching situation.

The philosophy used in the construction of this course is substantially that set forth in the report of the Science Committee which worked under the direction of the Progressive Education's Commission on the Secondary Curriculum.

The course is divided into fifteen units. The units include subject matter now included in courses in geology, astronomy, physical geography, chemistry and physics.

Each unit is based on the needs of the pupil as set up in the Science Committee's report. Each unit is divided into three parts—choice of the unit, content of the unit, and values and needs. Some values and needs are appreciations, social sensitivity, cooperativeness, reflective thinking, and the ability to interpret data.

Some units not usually found in a physical science course are—the solar system, climate of a given region, geological history of a region, techniques for reflective thinking, consumer education, and scientific technology.

The unit on reflective thinking is given in complete form as an illustration of how units are to be developed. It includes unit and major problems, an overview, assimilative materials, class activities, educational values, and evaluation exercises and topics for student investigation.

This new procedure in organizing materials to meet the needs of children will be watched with a great deal of interest.

IRA C. DAVIS.
University of Wisconsin

JERSILD, ARTHUR T. and FITE, MARY D. *The influence of Nursery School Experience on Children's Social Adjustments.* Child Development Monographs, No. 25. New York: Bureau of Publications, Teachers College, Columbia University, 1939. Pp. vi + 112. $1.60.

WHEELER, OLIVE A. and EARL, IRENE G. *Nursery School Education and the Reorganization of the Infant School.* London: University of London Press, Ltd., 1939. Pp. v + 172. 5 shillings.

FOSTER, JOSEPHINE C. and MATTSON, MARION L. *Nursery School Education.* New York: D. Appleton-Century Company, 1939. Pp. xii + 361. $2.50

These two books on nursery school education, one English and one American, published about the same time typify certain essential differences between the British and the American nursery school movement. Both books serve as textbooks for the training of teachers, and both are based on actual experience. Both are concerned with the learning that comes with growth and living rather than that which depends on formal instruction. Each is well illustrated.

Nursery School Education and the Reorganization of the Infant School is divided into two parts. The first, by Dr. Wheeler, presents a more general discussion of the advantages of nursery school education and the essentials of good nursery schools. The particular needs of preschool children, the importance of play in education, and the mutual responsibilities of the home and the public school are considered in detail. Dr. Wheeler presents clearly the distinction between the infant school and the

nursery school and contrasts the methods of work with emphasis on the wholesome modification of the former by the latter.

The modification of the infant school to approximate the nursery school in equipment and procedure had been going on before the present war for a considerable period of time. In the reorganized infant school, many-sided growth of the children was assuming greater importance. No one can see, of course, what the results of evacuation of preschool children will be nor the effect on nursery school and infant school. It stands to reason, however, that the school procedures will be definitely modified by the enlarged experience of nursery school teachers and infant school teachers, who, perhaps, are for the first time responsible for the twenty-four-hour care of children.

The second half of this volume by Irene G. Earl deals with procedures and practices and gives a description of activities and helpful suggestions with regard to the actual teaching of children. All in all, this book is a clear and valuable picture of the nursery infant's school as it existed in England just before the war.

The Foster and Mattson, *Nursery School Education,* is a comprehensive, sane, well-considered presentation of nursery education. It is undoubtedly the best book now available in the field. Its discussion of the growth of the child, the educational provisions necessary to facilitate this growth, the discussion of methods and procedures, and the clear discussion of the home-school relationships make this book invaluable. A well-chosen bibliography adds to the value of the book.

In contrast with the English book this volume devotes little space to the justification of the nursery school. This is due in part to the more general acceptance of the nursery school in the United States and in part, to the fact that in England infant schools have for many years been an established part of tax supported education. The inclusion of findings of various investigations lends force to the conclusions of the authors which in themselves carry weight by value of the reputation of each.

The recent death of the senior author Josephine Curtis Foster brings to an untimely end a particularly sane and scholarly contribution to early childhood education. Dr. Foster's gifts and achievement were of a high order and her place will not be easily filled.

Dr. Jersild who has contributed so extensively to our greater knowledge of children has, with Miss Fite, presented a further study of social behavior in children, *The Influence of Nursery School Experience on Children's Social Adjustments.* This volume which adds to the series of monographs in Child Development from Teacher's College was "focused on probing the effect of nursery school experience and social adjustments." The children who serve as subjects were eighteen children in the nursery schools of the Child Development Institute, and the method used was that of direct observation, a modified form of the diary record. This study deals with the social adjustments of children in nursery school and the influence of nursery school experience on such adjustments. The conclusions, of course, must be tentative but undoubtedly the carry-over of previous nursery school experience is such that children are described as more "sociable." This initial advantage, however, tends to disappear. In other words, children entering nursery school gradually develop more social fa-

cility. Case histories are noted to show that the pattern of social adjustment varies considerably from child to child. In judging a particular child or in appraising the effect of nursery school environment upon him the authors say: "It is necessary as far as possible to consider the various acts in relation to the record of his behavior as a whole."

Such studies as these are valuable in drawing our attention to particular aspects of a social behavior. It is to be hoped that their number may be increased. In the practical utilization of such findings the authors' caution with regard to the appraisal of a particular child's social development must be borne in mind. Overt social behavior in little children is so fluid a matter, changing in terms of environmental factors both subjective and personal, affected by health, by weather, and by such a multitude of factors that to focus attention on any one aspect, such as contact between children, distorts the whole; on the other hand, the only possibility of arriving at a perfect understanding is by a study of particular aspects.

It is difficult to translate such findings as this from one situation to another because the teacher's management of the child will vary so. In some schools, children work out their own problems with less aid from the teachers. Moreover, if a child showing very marked behavior traits is added to the group, for the time being the social behavior of the group is altered. However, there are forms of behavior characteristic of stages of growth. The importance of a greater understanding of exactly what these forms of behavior may be justifies such studies as this.

LOVISA WAGONER.
Mills College, California

Research Abstracts and Bibliographies

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BLOSE, DAVID T., and ALVES, HENRY F. *Statistics of State School System, 1937–38.* Office of Education Bulletin No. 2, Chapt. II, 1940. Washington: Government Printing Office, 1941. Pp. viii + 172.

Presents data on enrollment, attendance, financial support, expenditures and related topics.

CHASE, STUART. *What the New Census Means.* Public Affairs Pamphlet No. 56. New York City: Public Affairs Committee, Inc., 1941. Pp. 30.

A brief verbal-visual interpretation of the 1940 United States Census.

Family Expenditures in Selected Cities, 1935–36. United States Department of Labor, Bureau of Labor Statistics Bulletin No. 648. Washington: Government Printing Office, 1941. Pp. xii + 385.

The material presented in this volume was secured from a survey conducted in 1936 by the United States Bureau of Labor Statistics.

GRAY, RUTH A. *Bibliography of Research Studies in Education, 1938–39.* Office of Education Bulletin No. 5, 1940. Washington: Government Printing Office, 1940. Pp. xiv + 411.

A classified, annotated bibliography of research for 1938–39.

HERLIHY, LESTER B., DEFFENBAUGH, WALTER S., and COVERT, TIMON. *Statistics of City School Systems, 1937–38.* Office of Education Bulletin No. 2, Chapt. III, 1940. Washington: Government Printing Office, 1941. Pp. vii + 358.

Presents data on enrollment, school attendance, pupil-teacher rating, the school term, supervisory and teaching staff, salaries, etc.

HOLY, T. C. *Comparison of Costs per Pupil in Average Daily Attendance in Ohio County School Districts from July 1, 1939, to June 30, 1940.* Columbus, Ohio: Bureau of Educational Research, Ohio State University, 1941. Pp. iii + 8.

Second annual report of per pupil costs in county school districts.

KELLY, FRED J. *et al. Collegiate Accreditation by Agencies Within States.* Office of Education Bulletin No. 3, 1940. Washington: Government Printing Office, 1941. Pp. xi + 219.

A survey of the historical development, current practices, and problems and issues in collegiate accreditation by agencies within states.

MEECE, LEONARD E. *A Manual for School Board Members.* Bulletin, of the Bureau of School Service, Vol. XIII, No. 3. Lexington, Kentucky: University of Kentucky, 1941. Pp. 38.

This bulletin was prepared to help board members to become better informed of their duties and responsibilities.

MITCHELL, A. GRAEME. *Pediatric Bibliography.* Monographs of the Society for Research in Child Development, Vol. VI, No. 1. Washington: Society for Research in Child Development, National Research Council, 1941. Pp. vii + 119.

An extensive classified bibliography on references that would seem important for students and practitioners of pediatrics.

MORGAN, WALTER E. *Financing Public Education in California.* Revised edition. Bulletin of the California State Department of Education, Vol. X, No. 1. Sacramento, California: California State Department of Education, 1941. Pp. viii + 23.

A revision of a printed bulletin published in 1937 on methods of financing public education in California.

SMITH, HENRY LESTER, and EATON, MERRILL, T. *The Scholastic Achievement of Athletes at Indiana University.* Bulletin of the School of Education, Indiana University, Vol. XVII, No. 2. Bloomington, Indiana: Bureau of Cooperative Research, 1941. Pp. 16.

The authors report the scholastic records of athletes at Indiana University was commensurate with their aptitude as measured by the American Council Psychological Examination.

STUDENSKI, PAUL, and MORT, PAUL R. *Centralized vs. Decentralized Government in Relation to Democracy:* Review of the Arguments Advanced in the Literature of Various Nations. New York: Bureau of Publications, Teachers College, Columbia University, 1941. Pp. vii + 69.

The authors organize the arguments into four categories: (1) the merits of well-conceived local control; (2) shortcomings of excessive decentralization; (3) advantages of well-conceived central control; and (4) shortcomings of excessive centralization.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

CHAMBERS, M. M., ed. *The Ninth Yearbook of School Law.* Washington: American Council on Education, 1941. Pp. viii + 200.

A topical summary of decisions of the higher courts of the United States relating to various aspects of public education.

DEFFENBAUGH, W. S. *Practices and Concepts Relating to City Boards of Education, Volume I, Chapter VII.* Biennial Survey of Education in the United States, 1938–40. Washington: Government Printing Office, 1941. Pp. iii + 27.

Discusses powers and duties of board members, qualifications, selection, number of members, term, organization, meetings, compensation and related topics.

School Support in Indiana. Research Service Bulletin No. 1, Indiana State Teachers Association. Indianapolis, Indiana: Research Service, Indiana State Teachers Association, 1941. Pp. viii + 82.

A report on expenditures for public elementary and secondary education in

Indiana (1939–40); school expenditures in Indiana and continental United States (1937–38); and trends in public school and other governmental expenditures in Indiana (1930–31, 1939–40).

SMITH, HENRY LESTER, and SCOTT, R. FOSTER. *Legal Relations of Pupils and Parents to the Public Schools of Indiana, Part I.* Bulletin of the School of Education, Indiana University, Vol. XVII, No. 4. Bloomington, Indiana: Bureau of Cooperative Research and Field Service, 1941. Pp. 81.

Discusses compulsory school attendance, instruction and course of study, textbooks, medical inspections, and related topics.

CURRICULUM AND OBJECTIVES

BROWN, CLARA M. *A Study of Prerequisite Sciences and Certain Sequent Courses at the University of Minnesota.* Minneapolis, Minnesota: University of Minnesota Committee on Educational Research, 1941. Pp. xii + 96.

A summary of researches relating to science prerequisites at the University of Minnesota.

Proceedings of the Seventeenth Annual Educational Conference and the Sixth Annual Meeting of the Kentucky Association of Colleges and Secondary Schools. Bulletin of the Bureau of School Service, Vol. XIII, No. 2. Lexington, Kentucky: University of Kentucky, 1940. Pp. 149.

Papers relating to the improvement of instruction at the college level, problems in the philosophy of education, postwar French politics, national defense, education of teachers in science, curriculum making and related topics.

REID, SEERLEY. *Radio and the Teaching of English:* A Study of the 10A English Curriculum in Rochester, New York. Evaluation of School Broadcasts Bulletin No. 22. Columbus, Ohio: Ohio State University, 1941. Pp. iv + 56.

The author finds that radio may supplement and enrich classroom instruction without loss of basic skills.

PUPIL GUIDANCE, WELFARE, AND DEVELOPMENT

BARKER, ROGER, *et al. Frustration and Regression. An Experiment with Young Children.* University of Iowa Studies: Studies in Child Welfare, Volume XVIII, No. 1. Iowa City, Iowa: University of Iowa Press, 1941. Pp. xv + 314.

Report of a series of studies of young children relating to frustration and repression based upon the Lewinian concept leading to a demonstration of the generalized character of regression.

BETTS, EMMETT A. and AUSTIN, AGNES SUTTON. *Visual Problems of School Children.* Chicago: The Professional Press, Inc., n. d. Pp. 80.

This is the first of a series of articles dealing with the seeing problems of elementary school children.

BETTS, EMMETT ALBERT, and AYERS, ARTHUR W. *Data on Sensation and Perception Tests, Part IV, Ametropia.* Meadville, Pennsylvania: Keystone View Company, 1941. Pp. 69.

The authors present further data on the clearness of vision with a discussion of certain conflicts of opinion that have arisen in this area.

CHAMBERLAIN, H. E. "Neurotic Personalities and Education," *Smith College Studies in Social Work, XI* (March, 1941), 179–190.

The author thinks neuroticism is on an upward trend and offers certain descriptive data by which neuroticism may be recognized.

Character Education and the Exceptional Child. Proceedings of the Sixth Conference on Education and the Exceptional Child. Langhorne, Pennsylvania: Child Research Clinic of the Woods School, 1940. Pp. 63.

A series of papers presented at the sixth conference on education and the exceptional child.

DRISCOLL, GERTRUDE. *How to Study the Behavior of Children.* Practical Suggestions for Teaching Number 2. New York City: Bureau of Publications, Teachers College, Columbia University, 1941. Pp. viii + 84.

Discusses opportunities for studying child behavior, methods of studying child behavior, and using the knowledge of child behavior in better teaching. Bibliography.

Genetic Psychology Monographs, Volume XXIII[2] (May, 1941), 239–385.

Reports two studies, one by Mary Woods Bennett, "Factors Influencing Performance on Group and Individual Tests of Intelligence," and another by Elizabeth W. Amen, "Individual Differences in Apperceptive Reaction: A Study of the Response of Pre-School Children to Pictures."

GREENLEAF, WALTER J. *Working Your Way Through College and Other Means of Providing for College Expenses.* Office of Education, Vocational Division Bulletin No. 210, Occupational Information and Guidance Series No. 4. Washington: Government Printing Office, 1941. Pp. v + 175.

This bulletin aims to provide information for those advising students on opportunities for high school graduates working their way through college.

GREENLEAF, WALTER J., and ZAPOLEON, MARGUERITE W. *Bibliographies on Occupational Information and Guidance.* Washington: Federal Security Agency, U. S. Office of Education, 1941. Pp. 11.

An annotated bibliography of forty-nine titles.

GRIFFITHS, BETTY, *et al.* "Factors Influencing Changes in School Adjustment between Kindergarten and the Second Grade," *Smith College Studies in Social Work,* XI (March, 1941), 191–284.

A follow-up of an earlier study in which the adjustments of the same children were re-studies two years later.

STATISTICS AND MEASUREMENT

JORDAN, PAUL H., and WOODY, CLIFFORD. *Evaluation in the Michigan Curriculum Program.* State of Michigan Department of Public Instruction, Bulletin No. 3030, Instructional Service Series No. 30. Lansing, Michigan: Eugene B. Elliot, Superintendent of Public Instruction, 1941. Pp. 12.

The authors present a discussion of the nature of evaluation with suggestions as to application in various areas.

Report of the Sophomore Testing Program, Spring 1940. Iowa State Teachers College Research Report No. 41. Cedar Falls, Iowa: Bureau of Research, Iowa State Teachers College, 1941. Pp. 28.

The author presents the results of the seventh consecutive annual application of the sophomore tests under the auspices of the Cooperative Test Service of the American Council on Education.

Twenty-eighth Annual Conference on Educational Measurements. Bulletin of the School of Education, Indiana University, Vol. XVII, No. 3. Bloomington, Indiana: Bureau of Cooperative Research, 1941. Pp. 42.

Discusses measurement in guidance, financing education, scholarship testing, and personnel problems.

Research News and Communications

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

American Youth Commission, 1940–41.—Publication of reports summarizing the research of several projects set up by the Commission was a major activity during the past year. The general report of the Commission, tentatively titled *Youth and the Future,* is being prepared and publication is expected about December 1.

The findings of a survey of public opinion conducted by the Commission in cooperation with the American Institute of Public Opinion have been abstracted and printed as a *N.E.A. Research Bulletin,* "What People Think About Youth and Education."

In process of preparation is *Color, Class, and Personality,* an interpretation of the series of five books that contain studies of several thousand individuals aimed at evaluating the effects of minority status on the personality development of Negro youth. It is being written by Robert L. Sutherland, director of the Negro studies. Three books of the series, published during the past year, are: *Growing Up in the Black Belt: Negro Youth in the Rural South,* by Charles S. Johnson; *Color and Human Nature: Negro Personality Development in a Northern City,* by W. Lloyd Warner, Buford H. Junker, and Walter A. Adams; and *Thus Be Their Destiny,* which presents findings of surveys in Milton, Pennsylvania, Greensboro, North Carolina, and Galesburg, Illinois.

Other publications that report extensive investigations are: *Time on Their Hands: A Study of Leisure, Recreation, and Young People,* by C. Gilbert Wrenn and D. L. Harley; *Youth, Family, and Education,* a survey of present curriculums for education in family living, written by Joseph K. Folsom; and *Youth-Serving Organizations,* by M. M. Chambers, an enlargement and revision of a handbook issued first in 1937, which tells the activities of 320 national non-governmental groups concerned with the care and education of youth.

Employment, occupational adjustment, vocational guidance, and the importance of work training in secondary school curriculums are considered in a number of volumes either published during the past year or in preparation. Kenneth Holland, who is in charge of studies of work camps, has prepared two resumes of privately supported work programs: *Work Camps For High School Youth* and *Work Camps For College Students.* An exploratory study of publicly supported programs, *Youth Work Programs: Problems and Policies,* by Lewis L. Lorwin, has been published; and the national aspects of youth employment and unemployment will be considered in a volume now being prepared under the direction of Paul T. David, associate director of the Commission.

Guideposts For Rural Youth, by E. L. Kirkpatrick, reports a variety of community programs that have been instituted in the farm areas. The Commission cooperated in the Institute for Rural Youth Guidance held in Washington in February, 1941, and edited the pamphlet, *Guidance for Rural Youth,* which condensed the findings presented at the Institute sessions.

A continuing study and revision of recommendations for the care and education of American youth under the defense emergency conditions resulted in adoption by the Commission of *Next Steps in National Policy For Youth* in January, 1941. Recommendations based on results of demonstration projects in ten C.C.C. camps and intensive surveys of camp conditions and enrollee attitudes were made under the title, *The Civilian Conservation Corps,* in December, 1940.

The Commission was established by the American Council on Education. Its work has been carried on through grants from the General Education Board. Floyd W. Reeves is director and Owen D. Young is chairman of the fifteen-member Commission, with its office located at 744 Jackson Place, Washington, D. C.

Educational Policies Commission.—In December, 1940, the executive committees of the National Education Association and the American Association of School Administrators, meeting in joint session in Chicago, voted to continue the existence of the Educational Policies Commission for another four years. Funds for the financing of the Commission have been made available by joint action of the General Education Board, the National Education Association, and the American Association of School Administrators. Approximately 75 per cent of the members of the Commission were reappointed, with provision for further change by rotation in office of 25 per cent of the elected members each year.

In January, 1941, at the suggestion of the National Committee on Education and Defense, the Commission invited to Washington the representatives of eight city school systems who worked with the staff in drafting teaching materials for use in studying the national defense program. As a result of two weeks of work by this group, the following six pamphlets were prepared: *Our Democracy, How May We Defend Democracy? Suggestions for Teaching American History in the Present Emergency, The School: An Arsenal For Democracy, How You Can Strengthen Democracy,* and *Current Documents on Democracy.* These have been widely used in various school systems.

In May, 1941, the Commission published *The Education of Free Men in American Democracy.* This was the last and, in a sense, the culminating or summary volume in the series published by the Commission to date. It enumerates the knowledges, loyalties, and disciplines that are necessary for preparation for the life of freedom in American democracy today, placing these requirements against the setting of a world in the grip of struggle and destruction.

Plans for the activities of the Commission during the fiscal year, 1941–42, call for continued activity in the formulation of educational policy, in promoting the study and use of policies already published on the part of the teaching profession and by the general public, and in implementing these policies into the

ongoing program of the schools to the greatest possible degree consistent with the resources of the Commission.

The secretary of the Commission is William G. Carr.

N.E.A. Research Division.—Recent activities of the Research Division of the N.E.A. are summarized under three headings.

Research Bulletins.—The September, 1941, bulletin is based upon a questionnaire study of theory and practice in regard to the education of superior students in junior and senior high schools. More than one thousand principals supplied information. Richard R. Foster, assistant director, is in charge of this project.

The November, 1941, bulletin summarizes data from the federal census of 1940. In a number of respects the report will resemble the earlier analysis of the 1930 census (January, 1938, "Population Trends and Their Educational Implications").

Tentatively scheduled for January, 1942, is a report of developmental and remedial reading practices in secondary schools. Descriptive materials have been obtained from classroom teachers and administrators in a number of typical secondary schools. Ivan A. Booker, assistant director, is directing the survey.

In March and May of 1942 will appear summaries of administrative practices affecting teacher personnel. Replies have been received from a representative group of city school systems. These bulletins will verify and extend certain types of information reported by the Division for more than a decade. Hazel Davis, assistant director, is in immediate charge of this study.

Yearbooks.—The Research Division is collaborating with a commission of the American Association of School Administrators in preparing the 1942 yearbook on health education. This volume will be distributed in February, 1942. The chairman of the commission is John L. Bracken, superintendent of schools, Clayton, Missouri.

Preliminary plans have been made for the 1943 yearbook on occupational adjustment under the chairmanship of Dewitt Morgan, superintendent of schools, Indianapolis, Indiana.

The 1942 yearbook of the Department of Elementary School Principals on "The In-Service Growth of School Personnel" will be available about September 1, 1942. The editorial committee and the Research Division are now considering the materials that have been sent in from the field.

Miscellaneous.—The Division expects to continue its activities in coordinating the studies of various N.E.A. committees in the fields of tenure, finance, retirement, and other teacher welfare problems. With funds supplied by the Highway Education Board, the Division will issue several new publications on safety education. Legislative problems, such as social security, taxation, and the Hatch Act, will be given special attention. Several useful publications have been planned to help teachers with instruction on Latin American affairs.

Frank W. Hubbard is Director of Research.

Junior College Terminal Education.—Recent developments in the study of junior college terminal education, which is being carried on by the American Association of Junior Colleges through

its Commission on Junior College Terminal Education, include: (1) publication during the past spring and summer of three important volumes, (2) the contributions of 125 additional junior colleges to various phases of the study, (3) projects now under way in nine institutions that are experimenting in terminal fields and analyzing problems of terminal education, and (4) three workshops held during the summer for inservice teachers.

The study is "the most ambitious program in the field of terminal education that has been undertaken by this or any other association," according to a statement by Rosco C. Ingalls of Los Angeles City College, California, who is chairman of the administrative committee of the Commission on Junior College Terminal Education.

The three recently published volumes, which are a significant part of the study, are: *The Literature of Junior College Terminal Education, Present Status of Junior College Terminal Education,* and *Why Junior College Terminal Education?* The first volume is an extensive bibliography and series of abstracts containing carefully classified and indexed references to some 1500 books, articles, monographs, and studies dealing with every phase of junior college terminal education in the past forty years.

The second report is a general summary of conditions in the field of terminal education as they now exist, with suggestion of major problems meriting further study. A special feature is a 64-page pictorial section showing a wide variety of terminal educational activities in thirty-nine junior colleges in all parts of the country. The third publication presents the fundamental reasons for the importance of terminal education in the junior colleges, as expressed by a large number of individuals. Quoted directly are the judgments of 497 educational leaders and 294 business and professional men.

The 125 institutions that have added their support to various additional proposed phases of the study made surveys during the past spring of the judgments of their students on terminal education, and each institution also reconsidered its own philosophy of education through faculty discussion based on suggestions provided in a pamphlet prepared by Walter Crosby Eells, executive secretary of the association.

The nine institutions in which projects are now under way, together with the project subjects, are as follows: Bakersfield Junior College, Cal., guidance procedures with oncoming student population; Los Angeles City College, Cal., aptitude tests for admission to semi-professional curriculum; Meridian Junior College, Miss., diversified occupations program; Pasadena Junior College, Cal., placement, follow-up, and continuation training; Rochester Athenaeum and Mechanics Institute, N. Y., use of cooperative work programs; San Francisco Junior College, Cal., surveying the community to determine needs for terminal courses; Scranton–Keystone Junior College, Pa., utilization of community committees; Weber College, Utah, courses suited to needs of Ogden (Utah) area; and Wright Junior College, Ill., evaluating the results of terminal courses.

The three summer workshops for teachers, which proved to be among the most stimulating aspects of the study, were held at the George Peabody College for Teachers, Nashville, Tenn., and at the University of California in Berkeley and

in Los Angeles. At the George Peabody workshop, studies were concerned mainly with the improvement and expansion of terminal education courses. Some of the topics under consideration at the University of California were community needs, guidance in terminal work, cooperative work programs, and selecting instructors for terminal field courses and constructing courses in these fields.

The most important contribution of these various developments in the study, according to a report by Dr. Eells, is "the stimulus which they are giving to hundreds of junior college administrators and faculty members to study their own problems and to devise terminal curriculums for the particular needs of the vast and increasing majority of young people who probably will complete their formal education in the junior college." The results of many of these activities, it is expected, will be published in other monographs in the near future.

The needs of the 256,000 students in junior colleges throughout the country in the fields of psychology, health education, family life, and aviation, and the better preparation of instructors for two-year terminal courses, are to receive intensive study by five special national committees of the American Association of Junior Colleges. Programs, curriculums, equipment, staff, and other factors related to the more effective preparation of junior college students in the four fields named will be investigated in the nation's 625 junior colleges during the coming year, and constructive recommendations will be made following this investigation at the next annual meeting of the association at Los Angeles in February, 1942.

Research Service in State Education Associations. — A survey by Arvid J. Burke, Director of Studies, New York State Teachers Association, reveals the following trends in the research activities of state associations:

1. Research Directors. — Since 1930 there has been a definite trend toward the employment of full time or part time professionally trained research workers in state education associations. Illinois apparently was the first state to provide such service. It has continued to maintain a well-supported research office since 1924. This year the research director was given a full time research assistant. Since 1924 at least seventeen other states have provided for research assistance. Three of these, Michigan, Kansas, and Georgia, have discontinued the service due to lack of funds. Iowa plans to add a research man in 1941. Michigan proposes to restore its service in 1941.

2. Research Committees. — There evidently has been an increase in the number of associations maintaining standing committees on research. The U. S. Office of Education, *Educational Directory* for 1931, reported four state associations with research committees — Iowa, Kentucky, Utah, and Washington. Utah now has a research director. In 1939 seven states reported research committees — Arkansas, Iowa, Kansas, Kentucky, Louisiana, New Jersey, and Oregon. Iowa will appoint a research man in 1941.

3. Appropriations for Research.—The amount of funds from state education associations spent for research has increased greatly since 1930. In the ten states for which both 1930 and 1940 data are available, appropriations for research increased from $18,590 to $44,300.

In 1939 sixteen states reported expenditures of $62,145 for research.

4. Research Activities.—There is some evidence to indicate an increasing volume of research activity on the part of state associations. Between 1930 and 1936 state associations reported 236 studies to the United States Office of Education. On the basis of the incomplete data available at this time, more than 244 studies were completed between 1936 and 1940. Oregon and Colorado reported many studies during the first period; data on these states since then are lacking. Illinois, Nebraska, New York, Ohio, and Washington have shown significant increases in the number of studies carried on.

5. Research Subjects.—Problems of the teaching profession occupy first place as subjects of study by state education associations. One hundred and eighty-three of the 480 studies dealt with such problems. In fact these problems seem to be gaining ground. Between 1930 and 1936 about 35 per cent of the studies related to the teacher's professional problems as compared with about 42 per cent between 1936 and 1940.

The professional problems studied, in order of importance, are: salaries, economic and social status, retirement and security, appointment and tenure, education and certification, and supply and demand.

During the period 1930 to 1936 school finance occupied second place as a subject of study. Sixty-four of 236 studies dealt with school finance. During 1936 to 1940 it continued to rank second, 94 out of 244. However, finance is gaining in importance, accounting for about twenty-seven per cent of the studies in 1930–1936 and about thirty-eight per cent in 1936–1940.

6. Format.—There is a marked improvement taking place in the reporting of research studies by state education associations. The number of mimeographed reports is decreasing in favor of printed reports. Photo offset methods of reproduction are increasing in popularity. The technical reporting, typical of university dissertations, is giving way to the simple graphic presentation of data.

7. Nature of Research Service.—There probably has been no significant change in the nature of the research activities carried on by state associations. Scanning of 480 titles of studies and reports, and an examination of over a hundred reports or publications, lead to the following conclusions:

a. State education associations do very little original or pure research, but they have made a contribution to the field of school finance.

b. The associations are making increasing use of available research in policy formulation and legislative activity.

c. Although the number of publications that may be classified under public relations decreased between 1930–1936 and 1936–1940, much of the research activity of state associations is for public relations use.

d. Much of the research activity of the associations may be classed as gathering statistics and facts for legislative bodies, committees, commissions, association officers, and in answer to requests for information.

e. State associations cooperate with state education departments, committees and commissions, other organizations, university centers, and individual members in the financing, data gathering, and publishing of research studies.

f. The research responsibility in the associations often is merged with one or more of the following responsibilities, especially the first two: public relations, legislation, and business management, but there is some tendency to divorce research from other responsibilities.

, No. 2

in the
d with
ing re-
e first
slation,
ut there
research